



Seat No. _____

HP-1603010702020700

M. Sc. (Sem.-II)

(CBCS) Examination

April - 2023

CT-7 : Physics

(Space Physics)

Time : $2\frac{1}{2}$ Hours / Total Marks : 70

Instructions : Attempt all questions. The figure on right indicates marks.

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

- (a) What is gaseous escape for Earth's Atmosphere?
- (b) Which constituents are active in the IR part of the solar radiation spectrum ?
- (c) Name the different parts of the neutral atmosphere based on its compositional change.
- (d) What is the "Coronal Mass Ejection" ?
- (e) Write the chemical composition of the Sun.
- (f) Draw the energy level diagram of excited atomic oxygen.
- (g) What do you mean by "lapse rate" ?
- (h) What is airglow ?
- (i) What are the coldest and hottest region of the Earth's atmosphere ?
- (j) Name the models for neutral atmosphere.

2 Answer any **Two** of the following : **14**

- (a) Derive the expression explaining the hydrostatic equilibrium in the Earth's Atmosphere.
- (b) Explain "Enthalpy" and "Entropy" for atmosphere with examples.
- (c) Describe the atmospheric vertical structure -based on the temperature profile.

- 3** Answer the following: **14**
- (a) Describe the radio wave propagation and refraction in the ionosphere using Snell's formula.
 - (b) Explain the working of ionosonde. Draw the sample ionogram and discuss the critical frequency.

OR

- 3** Answer the following: **14**
- (a) Explain how the radio wave is refracted by the ionosphere using Appleton-Hartree formula.
 - (b) Derive the equation of Chapman's production function for the ionosphere and discuss in detail.

- 4** Answer any **Two** of the following: **14**
- (a) Describe the morphology of the ionosphere in detail.
 - (b) Explain what is geomagnetic cavity? Draw the various parts of the Earth's magnetosphere and discuss each in detail.
 - (c) Describe the basic elements involved in the remote sensing of Earth's resources.

- 5** Write short notes on any **Two** : **14**
- (a) Describe the production and loss mechanism of stratospheric ozone.
 - (b) Energy interactions with the Earth surface features in terms of remote sensing.
 - (c) Structure and Composition of the Sun.
 - (d) Radiative balance in the atmosphere using absorption and emission process.
