



**PAS-1603010702020700** Seat No. \_\_\_\_\_

**M. Sc. (Physics) (Sem. IV) (CBCS) Examination**

**August - 2020**

**CT-7 : Space Physics**

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

[Total Marks : 70

**Instruction :** Attempt all questions. The figure on right indicates marks.

- 1 Answer Any **Seven** of the following : 14
- (a) List the names of different regions of neutral atmosphere in increasing altitude order.
  - (b) Define the scale height.
  - (c) How the ozone is produced and lost in the atmosphere?
  - (d) Write the simplified Appelton-Hartree formula and explain the terms.
  - (e) Write and explain the Snell's law.
  - (f) List the parameters which can be derived using Langmuir probe.
  - (g) Draw the characteristics of specular and diffuse reflectors.
  - (h) Define the "Black-body".
  - (i) What is GPS and for which purpose it is used?
  - (j) Why the geomagnetic field is so important?
- 2 Answer Any **Two** of the followings :
- (a) Draw the temperature profile of the earth's atmosphere. Explain each region in details. 7
  - (b) Describe the terms "Enthalpy" and "Entropy" and give one example of reaction for each mechanism. 7
  - (c) Derive the expression  $P = P_0 e^{-h/H}$  7
- 3 Answer the following :
- (a) Explain how the Earth's geomagnetic cavity is formed. Draw the cavity and describe each region of the geomagnetic cavity. 7

- (b) Describe the characteristics of plasmasphere of the Earth. 7

**OR**

- 3** Answer the following : 7
- (a) Discuss how the radio wave is refracted by the ionosphere. 7
- (b) Draw the block diagram of Ionosonde system and explain the features of the Ionogram obtained using it. 7
- 4** Answer Any **Two** of the following :
- (a) How the radiation coming from the sun interacts with Earth's atmosphere? Discuss why the knowledge of atmospheric window is important. 7
- (b) Explain the energy interaction with Earth's surface features. Define spectral reflectance. 7
- (c) Draw the spectral reflectance curve for the vegetation, soil and water. Discuss the feature of any one of the above in details. 7
- 5** Write short notes on Any **Two** : 14
- (a) Langmuir probe and Mass spectrometer techniques.
- (b) The thermal balance in the atmosphere.
- (c) The coherent scatter radar
- (d) GPS - a unique navigation system.
-