



**NCE-003-020203** Seat No. \_\_\_\_\_

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

**April / May - 2017**

**CT - VII : Space Physics**

*(Old Course)*

**Faculty Code : 003**

**Subject Code : 020203**

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**

- (1) Explain the terms "Entropy" and "Enthalpy "
- (2) Draw the energy level diagram of atomic oxygen.
- (3) List the names of different regions of neutral atmosphere in increasing altitude order.
- (4) Define the geomagnetic cavity.
- (5) Define Geo-potential height.
- (6) Define the specular and diffuse reflectors.
- (7) Explain the Snell's law of refraction.
- (8) Define scale height.
- (9) Name the different layers of ionosphere.
- (10) Only list the assumption made by Chapman.

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

- (a) Describe the atmospheric nomenclature based on temperature and composition.
- (b) Derive the expression for hydro static equilibrium and scale height.
- (c) Discuss the formation and destruction of ozone in the middle atmosphere.

- 3** Answer the following : **14**
- (a) Write the assumptions considered by Chapman to explain the ionospheric production. Also obtain the expression for rate of ionization at a height  $h$ .
  - (b) Discuss the loss mechanism in the ionospheric ionization.

**OR**

- 3** Answer the following : **14**
- (a) Using the simplified Appleton-Hartree formula, explain how the radio wave is refracted by the ionosphere.
  - (b) Draw the block diagram of Ionosonde and explain the working of it. Show the sample ionogram and discuss the critical frequency.

- 4** Answer Any **Two** of the following : **14**
- (a) Describe the energy interaction in the atmosphere and explain the scattering and absorption mechanism in the remote sensing.
  - (b) Discuss the real remote sensing system in detail.
  - (c) Define the spectral reflectance. Show how this property can be used to classify the different types of vegetation and trees.

- 5** Write short notes on Any **Two** of the following : **14**
- (a) Production and destruction of ozone
  - (b) The Geomagnetic cavity
  - (c) The ideal and real remote sensing system
  - (d) Structure and composition of the Sun.