



**DII-003-020203**

Seat No. \_\_\_\_\_

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

**May / June – 2015**

**Core Paper : CT - 7 : Space Physics**

**Faculty Code : 003**

**Subject Code : 020203**

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

[Total Marks : 70

Note: (1) All questions are compulsory. The figure on right hand side indicates marks.

Q(1) Answer ANY SEVEN of the following.

- (1) Explain that the troposphere is a good insulator. 2
- (2) Define scale height and geopotential height. 2
- (3) Write the chemical reaction through which the ozone is destroyed. 2
- (4) Draw the energy level diagram of excited atomic oxygen. 2
- (5) Draw the temperature profile of the neutral atmosphere and name the regions. 2
- (6) Draw the electron density profile of the ionosphere and name the regions. 2
- (7) What do you mean by  $\alpha$ -Chapman layer? 2
- (8) Define the event "solar flare". 2
- (9) Explain how the magnetopause is defined. 2
- (10) List the parameters of Ideal remote sensing system. 2

Q(2) Answer ANY TWO of the following.

- (1) Describe the hydrostatic equilibrium. Derive the expression for the scale height and explain its physical meaning. 7
- (2) Explain the Enthalpy and Entropy of the atmosphere. 7
- (3) Describe the Heat balance ,heat loss and heat transport in the atmosphere. 7

Q(3) Answer the following.

- (1) Describe how the solar Radiation balance in the atmosphere is achieved through absorption and emission. 7
- (2) Describe the thermal and photochemical effect of radiation. 7

OR

- (1) What are the assumptions made by Chapman in his theory of Ionospheric Production ? Explain through his theory how the ionosphere is produced. 7
- (2) How the  $\alpha$  and  $\beta$  layers are defined ? 7.

Q(4) Answer ANY TWO of the following.

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|---|---|
| (1) Show how the electromagnetic waves are reflected from the ionosphere using Snell's law. | 7 |
| (2) Explain any one ground based technique used for Ionospheric measurements.               | 7 |
| (3) Briefly discuss the Total Electron Content and Scintillation phenomena.                 | 7 |

Q(5) Write short notes on ANY TWO of the following.

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| (1) Formation of the Geomagnetic field and cavity                         | 7 |
| (2) Energy interaction with the atmosphere with respect to Remote sensing | 7 |
| (3) Comparison of Ideal and Real remote sensing system                    | 7 |
| (4) Structure and composition of the Sun                                  | 7 |
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