HDZ-003-1203004 Seat No. _____

M. Sc. (Physics) (Sem. III) (CBCS) Examination

November / December – 2017

ET - 2 : Physics of Ionosphere & Magnetosphere System

Faculty Code : 003

Subject Code : 1203004

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.
(2) The figures on right side indicate marks.

1 Answer Any **Seven** of the following. Each of two marks : **14**

(1) Explain the EIA (Equatorial Ionospheric Anomaly)
(2) How the scintillation of radio wave is produced?
(3) Explain the reason for the "cowling conductivity".
(4) Explain why the "dynamo region" exists.
(5) Discuss the mechanism responsible for airglow emission.
(6) What do you mean by TEC? What is TEC unit?
(7) Draw the energy level diagram of Atomic Oxygen.
(8) Explain the Lorentz force on charge particle.
(9) Name the types of conductivities in ionosphere.
(10) Why there exists auroral oval?

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

(a) Explain the effects of neutral air wind and electric field on the motion of charged particle. **7**

(b) Explain the Ionospheric conductivity. Discuss the types of conductivities. **7**

(c) What do you mean by Spread F ? How many types of Spread F you know? Show these events on a typical ionogram. **7**

3 Answer the followings :

(a) Briefly discuss the equatorial ionosphere and explain the Equatorial Ionospheric Anomaly (EIA) **7**

(b) Discuss how the scintillation of radio wave is produced. Explain how the drift of irregularities can be measured using scintillation observations. **7**

OR

3 Answer the followings :

(a) Describe the mechanism leading to airglow. Draw the block diagram of typical airglow photometer and explain its working. **7**

(b) Explain how the aurora is produced. What is auroral oval ? What are the various types of luminous emissions in the auroral event? **7**

4 Answer Any **Two** of the following :

(a) Describe the circulation pattern in the geomagnetism. Discuss in detail the viscous interaction to explain the momentum transfer. **7**

(b) Explain the magnetic linkage and the interaction of IMF with the geomagnetic field. Show how the geomagnetic field is modified because of this. **7**

(c) Draw the diagram of geo-magnetic cavity and discuss each regions. **7**

5 Write short notes on Any **Two** of the following : **14**

(a) Hall effect and Hall current in the ionosphere

(b) The ring current and Birlkeland current

(c) Equatorial electrojet

(d) Scintillation of radio waves.
