



JBA-003-1203004 Seat No. _____

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

December - 2019

ET - 2 : Physics of Ionosphere and Magnetosphere

Faculty Code : 003

Subject Code : 1203004

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

[Total Marks : 70

Instruction : All questions are compulsory. The figure on right side indicates 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) Define the "cowling conductivity"
- (4) Explain why the "dynamo region" exists.
- (5) Write the differences between airglow and aurora.
- (6) What do you mean by TEC? What is TEC unit?
- (7) Draw the energy level diagram of Atomic Oxygen
- (8) Explain the "Fountain effect".
- (9) Name the types of conductivities in ionosphere.
- (10) Why there exists auroral oval?

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

- (a) What is the motion of charged particles under the electric field and Collision ? Derive the equation of motion under these forces. **7**
- (b) Why the ionosphere is conducting? Explain the various 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 following :
- (a) Describe the Sq current system. Show how the magnetic field varies at different latitudes and how it is used to identify the Sq focus. 7
 - (b) Explain the scintillation of radio waves. Discuss the method of spaced receiver technique and its application as drift measurements. 7

OR

- 3 Answer the following :
- (a) Explain the various types of "Airglow". Discuss the importance of RED and GREEN wavelength emitted by atomic oxygen. Which parameters of the ionosphere can be derived using these measurements? 7
 - (b) Discuss the principle of airglow intensity measurement system with the help of block diagram and describe the function of each block. 7

- 4 Answer Any **Two** of the following :
- (a) How the Earth is protected from the hazardous radiation from the Sun? Use the geomagnetic cavity and its different regions if required. 7
 - (b) Discuss why the friction model failed. What is the present and well accepted model to explain the momentum transfer through magnetic linkage? 7
 - (c) Describe the magnetic storm time behavior of the field such as SC, Main phase and recovery phase. 7

- 5 Write short notes on Any **Two** of the following : 14
- (i) Equatorial electrojet
 - (ii) Aurora - a spectacular event
 - (iii) The Cowling conductivity
 - (iv) Lorentz force and gyration of charged particles.