

BT-5/D09

**ANTENNA AND WAVE PROPAGATION**

Paper : ECE-301(E)

Time : Three hours]

[Maximum Marks : 100

Note : Attempt five questions in all, selecting at least one question from each section.

**SECTION-I**

1. (a) Explain the following :
  - (i) Directivity.
  - (ii) Effective height.
  - (iii) Gain.
  - (iv) Radiation pattern.
  - (v) Radiation resistance. 2 × 5 = 10
- (b) Derive and explain the radiation pattern from a Hertzian Dipole antenna. 10
2. (a) Derive the relationship between Directivity and Maximum aperture. 10
- (b) Elaborate the difference between Directional, Omni directional and Isotropic antenna. 10

**SECTION-II**

3. (a) Explain and differentiate the working of Broadside and Endfire arrays. 10
- (b) Define and explain the principle of Pattern multiplication. 10
4. Define and explain the working of Chebyshev array. 20

**SECTION-III**

5. (a) Explain the operation and principle of E-plane Horn antenna. 10
- (b) Elaborate the working and significance of Reflector antennas. 10
6. (a) What is the concept of Frequency independent antennas ? Also explain the Rumsey's principle. 10
- (b) Explain the working of a Broadband antenna. 10

**SECTION-IV**

7. (a) What are the various factors to be considered for Radio wave propagation ? Explain all the factors. 10

8. (b) Explain the various Ionospheric abnormalities. 10
- (a) Explain the term Multipath fading of Radio waves. 10
- (b) Write short notes on the following :
  - (i) Critical frequency. 10
  - (ii) Virtual height. 10