

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 121668

Roll No.

**B. TECH.**

**Theory Examination (Semester-VI) 2015-16**

**ANTENNA AND WAVE PROPAGATION**

*Time : 3 Hours*

*Max. Marks : 100*

**Section-A**

**1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)**

- (a) Define radiation intensity.
- (b) Compare electric scalar potential and magnetic vector potential.
- (c) State reciprocity theorem.
- (d) What is Pattern Multiplication?
- (e) Give an application of loop antenna.
- (f) Give the value for radiation resistance of a centred half wave dipole.

- (g) Name and sketch an antenna which provides circularly polarized waves.
- (h) What are the different types of horn antenna?
- (i) Define corner reflector.
- (j) What are the effects of earth curvature on tropospheric propagation?

**Section-B**

**2. Attempt any five questions from this section. (10×5=50)**

- (a) State and Prove reciprocity theorem.
- (b) Derive the expression for power radiated by half wave dipole antenna.
- (c) Derive the radiation resistance of a loop antenna.
- (d) Explain the construction & working principle of Yagi-uda antenna.
- (e) Explain the design of rhombic antenna.
- (f) Explain any two application of reciprocity theorem.

- (g) Derive the expression for refractive index of ionosphere where  $N$  is ionic density.
- (h) What is binomial array? Draw the pattern of 10 element binomial array with spacing between the elements of  $3\lambda/4$  and  $\lambda/2$ .

### Section-C

**Note: Attempt any two questions from this section.**

**(15×2=30)**

3. With neat diagram explain the principle of parabolic reflector antenna and various types of feed used in it.
4. Explain the principle of rectangular horn antenna with neat sketch. Draw the various types of Horn Antenna.
5. With necessary illustrations, explain the radiation characteristics of multi element log periodic antenna & its application.