

Con/2372-07.

( REVISED COURSE )  
(3 Hours)ND-9377  
[ Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of remaining **six** questions.  
 (3) Assume **suitable** data wherever **required**.  
 (4) **Figures** to the **right** indicates **full** marks.

1. (a) Explain in brief – 10
  - (i) Directivity
  - (ii) Pattern multiplication
  - (iii) Isotropic and omnidirectional antenna
  - (iv) Friis transmission formula.
- (b) Derive the expression for electric and magnetic field for a small loop antenna. Compare them with those of infinitesimal electric pole. 10
2. (a) State and explain Maxwell's equation for electromagnetic field starting from Maxwell's equation deduce the wave equation for a plane wave in free space. Show that it represents propagating wave. 10
- (b) Compare half wave dipole antenna and folded dipole antenna. 10
3. (a) A broadside array consists of 4 isotropic sources with a distance of  $\lambda/2$  between them. Find – 10
  - (i) The array factor
  - (ii) Directions of major lobe and minor lobe maxima
  - (iii) Direction of minima
  - (iv) HPBW and FNBW
  - (v) Plot the pattern.
- (b) What is travelling wave antenna. Discuss different travelling wave antennas. 10
4. (a) Explain the different types of feeds for parabolic reflector antenna. 10
- (b) Explain Log – periodic antenna in detail. 10
5. (a) Explain Dolph–Tchebyscheff optimum distribution for linear array with non-uniform amplitude distribution. 10
- (b) Describe various feeding methods for microstrip antenna. Give applications. 10
6. (a) Draw and explain Yagi antenna. Sketch its radiation pattern. Write down the application of Yagi antenna. 10
- (b) Explain the mechanism of ionospheric propagation. Define critical frequency, MUF, OMF. 10
7. Write short notes on any **two** : 10
  - (a) Sky wave propagation 20
  - (b) Biconical antenna
  - (c) Sleeve dipole.