

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

PAPER ID : 2120

Roll No.

B.Tech.

(SEM. V) ODD SEMESTER THEORY EXAMINATION 2012-13

ANTENNA AND WAVE PROPAGATION

Time : 2 Hours

Total Marks : 50

Note :—Attempt all questions. All questions carry equal marks.

1. Attempt any **FOUR** parts of the following : **(2.5×4=10)**

Explain the following antenna parameters in brief :

- (a) Directivity
- (b) Radiation Intensity
- (c) Antenna Temperature
- (d) Antenna Impedance
- (e) A ground vertical antenna fed at the bottom with an r.f. current of 32 ampere at 1MHz produces field strength of 9 mV/meter at a distance of 100 km. Evaluate the effective height of such antenna.
- (f) An antenna has a field pattern given by $E(\theta) = \cos \theta \cos^2 \theta$ for $0 \leq \theta \leq 90$. Find the half power beam width (HPBW) and the beam width between first null (FNBW).

2. Attempt any **FOUR** parts of the following : **2.5×4=10**

- (a) Write equations for Far Field due to an alternating current element and explain them.

- (b) Draw and explain the pattern of two isotropic point sources of same amplitude and in phase quadrature.
 - (c) Explain the principle of pattern multiplication. Draw the radiation pattern of 2 half wave linear antenna separated a distance of $\lambda/4$ with zero initial phase.
 - (d) What is tapering ? Explain it using suitable example.
 - (e) Write short note on folded-dipole antenna.
 - (f) Write short note on design of Yagi-Uda antenna.
3. Attempt any **TWO** parts of the following :— **(5×2=10)**
- (a) Design helical antenna in normal mode of propagation.
 - (b) Write and explain Basinet's principle and its importance.
 - (c) What do you understand by microstrip antenna ? Write their applications and advantages.
4. Attempt any **TWO** parts of the following : **(5×2=10)**
- (a) Classify Reflectors. Design Horn Antenna. Give the concept of grounded Antenna.
 - (b) Explain the measurement of gain and directivity of an antenna in short.
 - (c) Write short note on feed methods for parabolic reflectors.
5. Attempt any **TWO** parts of the following : **(5×2=10)**
- (a) An ionospheric wave is reflected from a layer of height 200 km. The take off angle is 20° and the earth's radius is 6370 km. Calculate the skip distance if the earth is considered as (i) Flat surface and (ii) Spherical.
 - (b) Describe the effect of curvature of earth in space wave propagation.
 - (c) Differentiate between critical frequency and MUF in Ionospheric region. Explain the composition of Ionosphere.