(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 (θ) = cos θ cos2 θ for $0 \le \theta \le 90$. 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.