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

Paper ID : 131524 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. V) THEORY EXAMINATION, 2015-16

ANTENNA & WAVE PROPAGATION

[Time : 3 hours] **[Maximum Marks : 100]**

Section-A

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

   (a) Write three methods which might be used to generate circular polarisation for a lowearth-orbit satellite antenna communication system.

   (b) Explain why all practical antenna necessarily have maximum directivity greater than unity.

   (c) What are the difficulties in waveguide Propagation?

   (d) Find the terminal impedance of infinitesimally thin $\lambda/2$ slot antenna when the impedance of infinitesimally $\lambda/2$ dipole antenna is $73+42.5j\,\Omega$.

(e) What is radiation resistance?

(f) What do you mean by resonant and Non-resonant long wire abtenna?

(g) Define antenna array and Pont source.

(h) What are the advantages and disadvantages of rhombic antenna?

(i) What is anechoic chamber? For what purpose it is used?

(j) What do you understand by line of sight?

Section-B

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

(10×5=50)

2. Derive the Friis transmission line formula. Calculate the effective aperture of dipole length 2cm at a frequency of 1.2 GHz. What will be the power received for an incidental power density of 2m W/m²?

3. Esplain the concept of Antenna Temperature. Calculate the maximum effective aperture of a beam antenna having a HPBW of 30 degree and 35 degree in perpendicular planes intersecting in beam axis. Assume negligible side lobes.

4. Explain in detail about folded dipole antenna. How impedance of folded dipole antenna is related to the number of dipoles and radius of dipoles?

5. Explain the principle of pattern multiplication and its advantages. Give one example of Pattern Synthesis.

6. Write a short note on Microstrip antenna and Slot antenna.

7. What are the methods for Gain Measurement?

8. Describe the applications of Loop antenna? Write down the comparison between parabolic and reflector antennas?

9. Write short note on Ground wave propagations and space wave propagation?

Section-C

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

(15×2=30)

10. Explain the various modes of operation of a helical antenna. What is Horn antenna? Explain its applications.

11. Explain the mechanism of Ionospheric propagation with neat diagram. In an Ionospheric propagation, reflection take place at a height of 400 km and that the maximum denesity in the ionosphere corresponds to a 0.9 refractive index at 10MHz. Determine the ground range for which this frequency is MUF take earth's curvature into consideration.

12. (a) Discuss the method for the measurement of Radiation Pattern

(b) Design a three-element Yagi-Uda antenna at an operating frequency of 250MHz.

(c) For end fire array consisting of several half wave length long isotropic radiators to have a directive gain of 30. Find the array length and FNBW. What will be these values for Broadside array?

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