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EEC-504

(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 $73 + 42.5j \Omega$.

(1)

P.T.O.

- (e) What is radiation resistance?
- (f) What do you mean by resonant and Non-resonant long wire antenna?
- (g) Define antenna array and Point 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. Explain 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.

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- 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.

(3)

P.T.O

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 density 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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(4)

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