Reg. No. :

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Sixth Semester

Electronics and Communication Engineering

14UEC603 - ANTENNA AND WAVE PROPAGATION

(Regulation 2014)

Duration: 1:15hrs   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1.   Effective aperture is always ----------- than Physical aperture.

   (a) higher   (b) Θ (c) Elliptical   (d) Circular

2. Consider a lossless antenna with a directive gain of +6 dB. If 1 mW of power is fed to it, the load power radiated by the antenna will be

   (a) 4mW   (b) 1mW   (c) 7mW   (d) 1/4mW

3. A dipole antenna of $\lambda/8$ length has an equivalent total loss resistance of 1.5Ω. The efficiency of the antenna is

   (a) 0.89159%   (b) 8.9159%   (c) 89.159%   (d) 891.59%

4. The array that does not produce side lobes excepting principal lobe is

   (a) Broad side array   (b) End fire array

   (c) Yagi-Uda array   (d) Binomial array

5. Corrugations in conical horn antenna is provided to improve

   (a) Directivity   (b) Impedance matching
   (c) Beam symmetry   (d) Bandwidth

6. The relation between slot and dipole impedances is

(a) $Z_S Z_d = Z_i^2/4$

(b) $Z_S Z_d = Z_i^2/2$

(c) $Z_S Z_d = Z_d^2/4$

(d) $Z_S Z_d = Z_d^2/2$

7. A 13 element Yagi-uda antenna array produces a maximum gain of _____ dB (approx.).

(a) 5   (b) 9   (c) 14   (d) 3

8. For a Hertz dipole antenna, the Half Pore Beam Width (HPBW) in the E-Plane is

(a) 360° (b) 180° (c) 90° (d) 45°

9. A pulse of a given frequency transmitted upward is received back after a period of 5ms. The virtual height of the reflecting layer is

(a) h=CT/2   (b) h=2CT   (c) h=T/2C   (d) h=C/2T

10. _____ is not a type of fading.

(a) Polarization   (b) Skip   (c) Interence   (d) None of these

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Illustrate reciprocity principle with regards to antenna in detail with neat sketch

(8)

12. Deduce the field associated with short dipole and also explain power radiated and radiation resistance of short dipole. (8)

13. Design a rectangular micro strip patch with dimensions W and L over a single substrate, whose center frequency is 10 GHz. The dielectric constant of the substrates is 10.2 and the height of the substrate is 0.127 cm. Determine the physical dimensions W and L of the patch taking into account fringing fields. (8)

14. Explain the radiation mechanism of a 2 element Yagi-Uda Antenna. Derive its gain expression. (8)

15 Discuss the factors influencing the propagation of radio waves. Compare and contrast them. (8)

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