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SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2K SCHEME] EXAMINATION, APRIL 2013

EC 2K 602 – RADIATION AND PROPAGATION

Time : Three Hours

Maximum : 100 Marks

*Answer **all** questions.*

I. (a) Why triangular current distribution is not assumed for antenna analysis? Explain.

(b) Differentiate :

(i) Effective area from Actual area.

(ii) Effective length from Actual length.

(c) What is an antenna array? Explain its significance.

(d) Explain the design details of Dolph–Tchebyscheff array.

(e) Differentiate V antenna from rhombic antenna. Give the structures for them.

(f) What is a 2 reflector system? Explain. Give examples.

(g) Explain multihop propagation with a neat sketch.

(h) Define and explain :

(i) MUF.

(ii) Skip zone.

(iii) Critical ray.

(8 × 5 = 40 marks)

II. (a) (i) Derive the potential functions for sinusoidal oscillations.

(ii) What are short dipole and short mono pole antenna? Explain with neat sketches.

(7 + 8 = 15 marks)

Or

(b) (i) Derive Lorentz Reciprocity theorem for antennas.

(ii) Show the application of this theorem to a set of monopole antennas.

(7 + 8 = 15 marks)

Turn over

III. (a) Differentiate Broadside Array from End fire array. Derive the relation between the two.

Or

(b) Explain in detail the principle of pattern multiplication with neat sketches. Enumerate its features.

IV. (a) Draw a neat sketch of 3 element YAGI-UDA antenna array. Explain its construction and principle. Derive an expression for its gain.

Or

(b) Draw the log periodic dipole array structures for UHF and LHF frequency ranges. Derive the design details and equations.

V. (a) Explain the characteristics of space wave propagation. Derive an expression for Electric field strength in terms of heights of transmitting and receiving antenna.

Or

(b) Explain the characteristics of Ionosphere. Derive the characteristic equations of Ionosphere.

$[4 \times 15 = 60$ marks$]$