C 58321 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2009

EC 2K 602—RADIATION AND PROPAGATION

Time : Three Hours Maximum : 100 Marks

I. (a) Define and explain :

(i) Beam area.

(ii) Beam width.

(iii) Antenna Bandwidth.

(b) Compute the directivity of halfwave dipole antenna.

(c) What is horizontal broadcast array ? Sketch the array and explain its features.

(d) Explain the advantages and potential applications of Binomial array.

(e) Differential travelling wave antenna from standing wave antenna.

(f) What is offset fed reflector antenna ? Explain. Write its design formula.

(g) Define LOS distance. Obtain an expression for it.

(h) Define plasma frequency. Obtain an expression for it.

(8 × 5 = 40 marks)

II. (a) Define Radiation resistance. Derive radiation resistance equations for alternating current element and X/2 dipole antenna.

(15 marks)

Or

(b) (i) Give an account on network theorems for antenna analysis. (7 marks)

(ii) Explain the application of Babinet's principle for slot antennas. (8 marks)

III. (a) (i) Derive an expression for antenna array factor. (7 marks)

(ii) Explain the radiation mechanism of a simple 2 element array. (8 marks)

Or

(b) (i) Explain the design details of Binomial array. (7 marks)

(ii) Give an account on 'End Fire array'. (8 marks)

Turn over

IV. (a) What are the types of horn antenna ? Sketch them. Derive the design equations of pyramidal horn antenna.

Or

(b) Write technical notes on :

(i) Cassegrain antenna.

(ii) Rectangular microstrip antenna.

(7 + 8 = 15 marks)

V. (a) (i) Explain the effect of ground wave propagation. (7 marks)

(ii) Explain the mechanical considerations of tropospheric waves. (8 marks)

Or

(b) (i) Derive expressions for fcr, fmut of Ionosphere. (7 marks)

(ii) Derive the characteristics equations of Ionosphere. (8 marks)

[4 × 15 = 60 marks]