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Name................................

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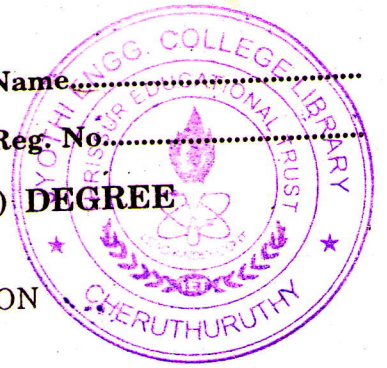
SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2007

EC 04 606—RADIATION AND PROPAGATION

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

*Answer **all** questions.*

1. (a) Show that the directivity of short vertical antenna is 3.28.

   (b) Differentiate effective aperture from actual aperture.

   (c) What are figure eight squared and figure eight cubed patterns ? Explain.

   (d) What is an uniform linear array ? Explain.

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

   (f) What is a two reflector system ? Explain with a neat sketch.

   (g) What is surface wave propagation ? Explain.

   (h) What is multihop propagation ? Explain with a sketch.

   (8 × 5 = 40 marks)

2. (a) (i) What is OED ? Explain with a neat sketch. (7 marks)

   (ii) Obtain the electric and magnetic field components of halfwave dipole. (8 marks)

   Or

   (b) (i) State and explain Babinet's principle. (7 marks)

   (ii) Explain in detail the development of dipole and folded dipole elements from transmission lines with neat sketches. (8 marks)

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

   (ii) Explain the effect of array length and element spacing on the radiation pattern of endfire and broad side antenna arrays. (8 marks)

   Or

   (b) (i) Obtain the design equations of Dolph-Tchebyscheff array. Draw a neat sketch of it. (7 marks)

   (ii) Differentiate Broadside array from Endfire array. (8 marks)

4. (a) (i) Draw a neat sketch of double V antenna and explain. Obtain the design equations of double V antennas. (7 marks)

   (ii) Differentiate primary from secondary radiators. (8 marks)

   Or

Turn over

(b) Draw a neat sketch of LPDA. Explain its radiation mechanisms in VHF and VHF ranges. Obtain the design equations.

(15 marks)

5. (a) (i) Describe the factors involved in the propagation of radiowaves. (7 marks)

       (ii) Obtain an expression for optical LOS range. (8 marks)

Or

(b) Write short notes on :

     (i) Critical frequency.   (ii) Virtual height.

     (iii) Ionospheric profile.   (iv) Plasma frequency.

     (v) MUF.

($5 \times 3 = 15$ marks)

[$4 \times 15 = 60$ marks]