Reg. No. : ....

Name : ....

VI Semester B.Tech. Degree (Reg./Sup./Imp. – Including Part Time) Examination, May 2013
(2007 Admn. Onwards)
PT 2K6/2K6 EC 603 : RADIATION AND PROPAGATION

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　Max. Marks : 100

Instruction : Answer all questions.

PART – A

1. a) Define antenna. Give the various applications of antenna.

   b) What is isotropic antenna ? Derive the relation intensity for the same.

   c) Define HPBW and BWFN. Obtain the relation between them.

   d) Discuss the main features of broad side array and end fire array.

   e) Discuss the important characteristics of broad band dipole antenna.

   f) Explain horn antenna with a neat figure.

   g) Discuss the normal refractions that occur in troposphere when a wave is travelling through it.

   h) Explain the principle of plasma reflections.　　　　　　　　　　(8×5=40)

PART – B

2. a) i) Define the followings :

   　　A) Beam area　　　　　　　　B) Beam efficiency

   　　C) Radiation intensity　　　　D) Effective aperture　　　　　　8

   ii) Distinguish between far field and near field pattern with a diagram.　　7

   　　　　　　　　　　　OR

   b) i) State and prove power theorem. Modify the expression in terms of radiation intensity.　　　　　　　　　　　　　　　　　　　　　　　7

   ii) State and prove reciprocity theorem.　　　　　　　　　　　　8

3. a) i) Derive an expression for total electric field due to two point sources with the origin at the centre of the two point sources. Obtain array factor, direction of peaks, nulls, half powers. **10**

    ii) Discuss the important feature of pattern multiplication. **5**

            OR

  b) i) For a broadside array, derive expression for angles of sidelobes and nulls. **10**

    ii) Discuss the principle of operation of binomial array. **5**

4. a) i) Explain the followings :

        A) Travelling wave antenna B) Rhombic antenna. **8**

    ii) Write a note on parabolic reflectors on transmitter end and receiver end with figure. **7**

            OR

  b) i) Write a short note on Casser grain antenna. **7**

    ii) Discuss the main features of log-periodic antenna. **8**

5. a) i) Discuss the principle of surface wave tilting. Derive an expression for tilt angle. **10**

    ii) Write a note on ground wave attenuation factor. **5**

            OR

  b) i) Explain the followings :

        A) Critical frequency

        B) Maximum usable frequency

        C) Virtual height

        D) Skip distance. **8**

    ii) Derive an expression for skip distance. **7**