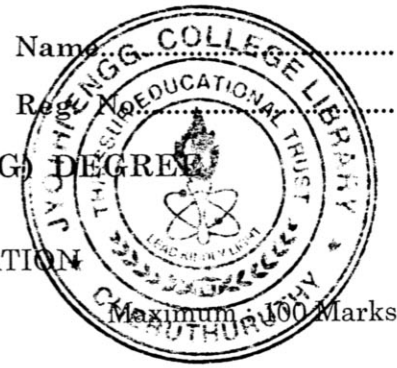C 28824

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2012

EC 2K 602—RADIATION AND PROPAGATION

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

1. (a) Comment on the relationship between a current element and an electric dipole.

   (b) Explain the terms directivity and effective area.

   (c) State the three fundamental theorems proposed by Schelkunoff.

   (d) Draw and explain the radiation pattern of a uniform current distribution 1.5 wavelengths long.

   (e) Explain the operation of long wire antenna.

   (f) Give the current distribution and radiation pattern of a folded dipole antenna.

   (g) Draw and explain the space wave pattern for the horizontal dipole at heights of one quarter wavelength and one half wavelength.

   (h) Explain about tropospheric scattering.

   (8 × 5 = 40 marks)

2. (a) Derive the expression for average power radiated from a halfwave dipole.

   Or

   (b) Explain about reciprocity theorem, self impedance, mutual impedance and beam efficiency with respect to antenna.

3. (a) Discuss about array of *n* isotropic sources of equal amplitude and spacing broadside case.

   Or

   (b) Explain about binomial arrays and Dolph-Tchebyscheff arrays.

4. (a) (i) What is a rhombic antenna ? Describe its construction and properties with special reference to directivity and bandwidth.

   (8 marks)

   (ii) Explain about Cassegrain antenna.

   (7 marks)

   Or

   (b) Describe the construction and operation of Yagi-Uda antenna and parabolic reflector.

5. (a) Explain about space wave and surface wave propagation.

   Or

   (b) What is meant by critical frequency ? How can it be measured ? Discuss the effect of the ionosphere on short wave propagation.

   [4 × 15 = 60 marks]