C 20556

Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2006

EC 2K 602—RADIATION AND PROPAGATION

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

I. (a) State and explain Babinet's principle for complementary antennas.

(b) State and derive reciprocity theorem.

(c) What is the need for antenna array ? Explain.

(d) Show that a binomial array does not have sidelobes with an example.

(e) What are primary Radiators ? Explain. Give examples.

(f) Give an account on "Broadband dipole".

(g) Explain the 2 ray model of space wave propagation with a neat sketch.

(h) State and explain the characteristics of Ionosphere.

(8 × 5 = 40 marks)

II. (a) (i) What are the *three* different antenna field zones ? Explain them.

(ii) Define and explain : (1) Gain ; (2) Directivity ; and (3) Self-impedance.

Or

(b) Derive an expression for power radiated by an oscillating electric dipole.

III. (a) Explain in detail the principles of BSA and EFA with neat sketches.

Or

(b) Write technical notes on :

(i) Binomial array.

(ii) Dolph-Tchebyscheff array.

IV. (a) What are the different types of horn antennas ? Explain their structures and principles of operation in detail.

Or

(b) Draw a neat sketch of a two reflector system. Explain its principle of operation. State its merits and limitations. Compare it with single reflector system.

V. (a) (i) Explain the characteristics of Troposphere.

(ii) Derive the characteristics equations of Ionosphere.

Or

(b) (i) Explain in detail the reflection and refraction of waves by the Ionosphere.

(ii) Give an account on 'plasma frequency'.

(4 × 15 = 60 marks)