24235

B.Tech. 5th Semester Electronics and Communication Engg.-III Examination December–2013

ANTENNA, WAVE PROPAGATION AND T.V. ENGG.

Paper–EE-307-F

Time allowed : 3 hours] *[Maximum marks :100*

Note : Question no. 1 is compulsory. Attempt five questions in all, one question from each section.

1. (a) What do you mean by directivity and aperture for radio antennas.

   (b) Show that radiation resistance of a half wave dipole is 73 ohms.

   (c) State clearly the difference between a broad side array and end fire array.

   (d) Why is scanning necessary in T.V. transmission? Why is it carried out at a fast rate ?

   (e) What is meant by the deflection angle of a picture tube ? 5×4=20

Section-A

2. (a) Define 'gain' and 'beamwidth' of an antenna and enumerate the factors which effects them. 10

   (b) State and prove the reciprocity theorem for antenna. 10

3. (a) Explain in detail Retarded vector potential. 10

(b) A thin dipole antenna is $\lambda/15$ long. If its loss resistance is 1.5Ω, find radiation resistance and the efficiency. 10

Section-B

4. Derive wave equation for radiated fields from current and voltage source in terms of electric scalar and magnetic vector potential. 20

5. (a) Explain the effect of ground on antenna pattern. 10

(b) Discuss the relation between current distribution and field pattern of an antenna. 10

Section-C

6. (a) Explain the principle of pattern multiplication and find the array factor of a two element array. 10

(b) Explain in detail the different properties of multielement array. 10

7. (a) Explain the operating principle of microwave antenna with diagram. 10

(b) Explain the maximum usable frequency and show its relationship with angle of incidence and the critical frequency. 10

Section-D

8. (a) Draw and explain the block diagram of monochrome television receiver. 10

   (b) Explain the transfer characteristics of a picture tube. 10

9. (a) Draw cross sectional view of an image orthicon camera tube and explain. 10

   (b) Why is an aluminized coating provided on the phosphor screen ? How are any stray ions prevented from hitting the screen ? 10