



**B.E./B.Tech.(Full Time) DEGREE END SEMESTER EXAMINATIONS, APR/MAY2012
ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH**

SEVENTH SEMESTER

EC 474 – ANTENNAS AND WAVE PROPAGATION

(REGULATIONS 2004)

Duration: 3 Hours

Max.marks:100

Answer ALL questions

PART-A (10x2=20 Marks)

- 1.Distinguish between pattern bandwidth and impedance bandwidth.
- 2.Define antenna noise temperature.
- 3.What is meant by aperture blockage?
- 4.Compare uniform aperture and tapered aperture.
- 5.List the merits of phased arrays.
- 6.Give an example for pattern multiplication.
- 7.Specify the advantages of using turnstile antennas in VHF communication.
- 8.Write down the characteristic equation to represent the cone angle for the infinite bi-conical antenna.
- 9.What does the collision frequency represent?
- 10.Define substandard refraction.

PART-B (5X16=80 Marks)

- 11.(i)Derive, from basic principles, the expression for radiation resistance of a half-wave dipole, assuming that the current is sinusoidally distributed. (8)
 - (ii)Explain, with relevant diagrams, the various types of baluns used for exciting the center-fed dipoles. (8)
 - 12.(a)(i)Derive the design equations of horn antenna. (8)
 - (ii)Explain the geometry of Cassegrain feed. Mention its advantages. (8)
- OR**
- 12.(b)Obtain the expressions for radiated fields from rectangular aperture mounted on an infinite ground plane. (16)
 - 13.(a)(i)With block diagram explain the principle of a two element adaptive array. (8)
 - (ii)Write the mathematical substantiation of binomial array. (8)

OR

13.(b) Compare the features of broad side array, end fire array and Hansen-Woodyard array. (16)

14.(a)(i) Discuss the slotted cylinder antennas in detail. (8)

(ii) In a log periodic dipole array, describe the relationship between apex angle, scale constant and spacing. (8)

OR

14.(b)(i) How do you classify the antenna range instrumentation in radiation pattern measurement? List the main techniques to measure the polarization state of a radiator. (8)

(ii) Discuss briefly on construction and working principle of turnstile antenna. (8)

15.(a)(i) Explain the role of effective dielectric constant of an ionized gas. (8)

(ii) Discuss the atmospheric ducts in detail. (8)

OR

15.(b) Describe the mechanism of refraction of radio waves by the ionosphere. (16)