(Following Paper ID and Roll No. to be filled in your Answer Books)		
	Roll No.	

B.TECH

Theory Examination (Semester-VI) 2015-16

ANTENA AND WAVE PROPOGATION

Time : 3 Hours   *Max. Marks : 100*

SECTION-A

1. Attempt all parts. All parts carry **equal** marks. Write answer of each part in short**. (2 x 10 =20)**

    a)   List the uses of loop antenna.

    b)   What is log periodic antenna.?

    c)   What is an array and mention the various forms of antenna arrays ?

    d)   What is Binomial array?

    e)   What is a Short Dipole?

    f)   What is meant by Skip Distance?

    g)   Explain Duct propogation.

    h)   Draw the structure of 3-elements yagi-uda antenna and give the dimensions and spacing between the elements in terms of wavelength?

    i)   State the Rumsey's Principle.

    j)   What is Fading? And how it is compensated.

SECTION-B

Attempt any **five** questions from this section.   **(10 x 5 = 50)**

2. State Babinet's principle and how it gives rise to the concept of Complementary antenna.

3. How the Circularly polarized radiation is produced from various antennas?

4. Derive the Electric and Magnetic field components of a Half wave Dipole.

5. For a two element linear antenna array separated by a distance of d=3λ/4, derive the field quantities and draw its radiation pattern for the phase difference of 45°.

6. Define Skip Distance and Maximum Usable Frequency (MUF). Find the skip distance for waves of frequency 5.2×10^6 Hz at a time when maximum ionization in the E region has a value of 1×10^{12} e/m^3 at a height of 120 km.

7. Explain the principle of rectangular Horn antenna with a neat sketch. Draw various types of Horn structures.
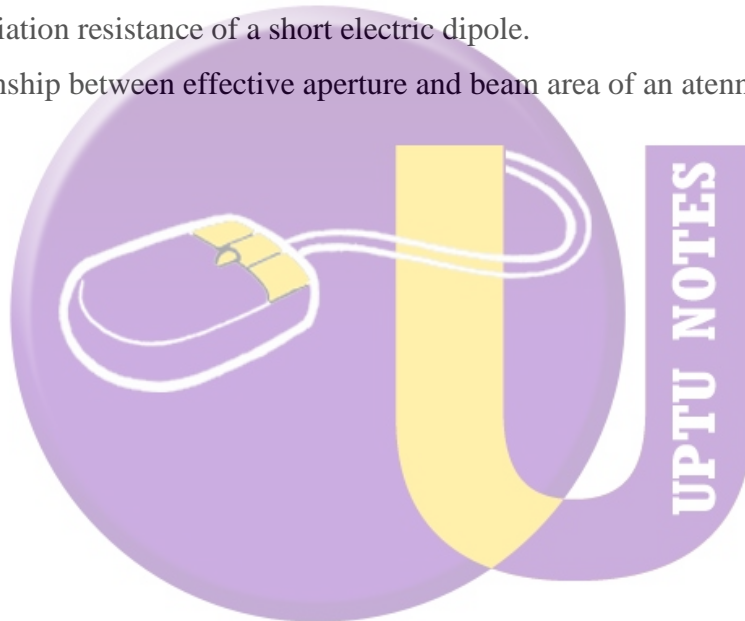
8. Describe the theory of propagation of Electromagnetic wave through the ionosphere in the presence of external magnetic field.

9. What is an Optimum Horn? Sketch and Explain its characteristics along with dimensional relations.

SECTION-C

Attempt any **two** questions from this section. **(15 x 2 = 30)**

10. (i) Calculate the maximum effective aperture area of antenna which is operating at a wavelength of 2 meters and has a directivity of 100.

    (ii) State reciprocity theorem. Explain the reciprocity of any one of the antennas.

11. (i) Explain the Feed methods for Parabolic Reflectors.

    (ii) Discuss the effect of ground on Antenna Performance.

12. (i) Derive the radiation resistance of a short electric dipole.

    (ii) Derive relationship between effective aperture and beam area of an atenna.