Code: EC5T4

## III B.Tech - I Semester–Regular Examinations December 2016

# ANTENNA AND WAVE PROPAGATION
## (ELECTRONICS AND COMMUNICATION ENGINEERING)

Duration: 3 hours                    Max. Marks: 70

## PART – A

Answer **all** the questions.   All questions carry equal marks

$$11 \times 2 = 22 \text{ M}$$

1.

a) Define Beam Area and Beam efficiency.

b) The radiation intensity of a particular antenna is given $U=\sin^2\theta$. Determine the directivity of the antenna.

c) Name four types of array antennas.

d) Compare the characteristics of half wave dipole and quarter wave monopole.

e) Justify how radiation resistance is improved for a Folded Dipole.

f) What is spill over in paraboloidal reflectors?

g) What should be the ideal F/D ratio for a Paraboloidal reflector antenna and why?

h) What is the distance criterion that has to be followed for antenna measurements?

i) What is wave tilt in ground wave propagation?

j) What is optimum frequency in sky wave propagation?

k) Differentiate between resonant and non-resonant antennas.

# PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2. a) Prove mathematically that directivity of quarter wave monopole is twice that of half wave dipole.  9 M

   b) Explain the radiation mechanism in a dipole antenna.  7 M

3. a) Compare Broadside and Endfire Array antennas.  8 M

   b) Justify how by using the Hansen & Woodyard condition, directivity of an Endfire array can be improved.  8 M

4. a) Explain about the modes of operation in a Helical Antenna.  10 M

   b) Give the constructional details about Yagi Uda Antenna.  6 M

5. a) Explain the measurement of gain of an unknown antenna using Absolute method.  10 M

   b) Explain about the various feed systems used in Parabolic reflector antennas.  6 M

6. a) Explain about Ionospheric abnormalities. 10 M

   b) Explain the terms Critical frequency, MUF, LUF,OF and
      Skip Distance. 6 M