Code: EC5T4

III B.Tech - I Semester – Regular/Supplementary Examinations October 2018

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
                                                11x 2 = 22 M

1.
   a) Define Beam efficiency.
   b) Distinguish between isotropic and directional radiators.
   c) Distinguish between broadside and endfire array.
   d) Define first side lobe ratio(SLR) and mention its value for uniform linear array.
   e) Discuss the demerits of Rhombic antenna.
   f). Distinguish between resonant and non-resonant radiators.
   g) Mention the applications of reflector antennas.
   h) Compare the advantages of Lens antennas compared to paraboloid antennas.
   i) Describe the importance of Cassegrain feed.
   j) Compare the frequency range of Ground wave and Space propagation.
   k) If the heights of transmitting and receiving antennas are 100 m and 64 m respectively, find the maximum range of communication between the two antennas.

PART – B

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

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

2. a) Derive the expression for the power radiated by a Quarter-wave monopole and find the radiation resistance. 8 M

   b) Define the terms Radiation intensity, directive gain, Power gain, and directivity of an antenna. 8 M

3. a) Obtain the expression for the total far field (E) at distant point due to a linear array of 'n' elements fed in phase with equal amplitudes and equal separations. 8 M

   b) By using pattern multiplication technique, Estimate the radiation pattern of N=4 element, d=λ/2 of binomial array Antenna. 8 M

4. a) Explain in detail the operating principles of Helical antennas. List out their applications. 8 M

   b) With a neat sketch explain the operation of Yagi-Uda array. 8 M

5. a) Discuss Dielectric and metal Lens Antennas and their applications. 8 M

b) Discuss the design of Horn antennas and their applications.

8 M

6. a) Describe briefly the salient features of ground wave propagation.

8 M

b) What should be the polarization of EM wave for the ground wave propagation? Justify.

4 M

c) Explain the term 'wave tilt of surface waves'.

4 M