PVP 12

Code: EC5T4

III B.Tech - I Semester – Regular Examinations - November 2014

ANTENNAS AND WAVE PROPAGATION
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Marks: 5x14=70

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

1. a) Explain the current distribution on a thin wire antenna. 6 M

   b) Write short note on following terms 8 M

   i) Beam width. ii) Beam area.

   iii) Beam Efficiency. iv) Radiation Patterns.

2. a) Explain the concept of retarded scalar and vector potentials. 7 M

   b) If maximum current in the antenna is 20 amps, find the field intensity at a distance of 2 Kms along the axis perpendicular and at an angle 30^0 from the antenna. 7 M

3. a) What is the need of antenna arrays? Explain three different types of arrays. 8 M

   b) A broadside array operating at 100cm wavelength consists of four halfwave dipoles spaced 50cm. Each element carries radio frequency current in the same phase and of magnitude 0.5 amperes. Calculate 6 M

   i) Radiated power.

   ii) Half width of the major lobe.

4. a) Explain different modes of operation of helical antenna in detail. 7 M

b) Find number of turns, turn diameter and axial ratio of right circularly polarized axial mode helical antenna with 17dB gain for operation at 1600MHz with turn spacing λ/π. 7 M

5. a) Write about flat sheet, corner and paraboloidal reflectors. 7 M

b) A parabolic dish provides a gain of 75 dB at a frequency of 15 GHz. Calculate the capture area of the antenna, its 3dB and null beam widths. 7 M

6. a) Explain about zoned lens antennas. 6 M

b) Describe the method for measuring the gain and radiation pattern of an antenna. 8 M

7. a) Explain space wave propagation with its limitations. 7 M

b) A 150m antenna transmitting at 1.2MHz by ground wave has an antenna current of 8A. What voltage is received by the receiving antenna 40Km away, with a height of 2m. 7 M

8. a) What are the different mechanisms of EM wave's propagation? Explain. 7 M

b) Derive the relation between MUF and skip distance. 7 M