PVP 12

Code: **ECMC1T5B**

I M.Tech-I Semester-Regular Examinations-April 2013

ANTENNA ARRAYS AND SYNTHESIS

(MICROWAVE & COMMUNICATION ENGINEERING)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. (a) Explain the following terms related to Antenna
   (i) Side Lobe Level (ii) Polarization
   (iii) Effective length (iv) Antenna Impedance
   8 M

   (b) A transmitting antenna has an effective height of 614 mts and takes a r.m.s current of 50 Amps at a wave length of 625 mts. Find radiation resistance, radiated power and antenna efficiency if the antenna loss resistance is 5Ω.
   6 M

2. (a) What is a linear array and explain about different types of amplitude excitations for array synthesis with diagrams?
   7 M

   (b) If the array factor of a linear array has zeros at $\phi=90^0$, 180^0,270^0 and the elements are spaced at $\lambda/4$, design the array.
   7 M

3. (a) Define mutual coupling effect and explain the methods to avoid the coupling effect in an Array ? 7 M

(b) What is a Schelkunoff's unit circle representation , explain its importance? 7 M

4. (a) Derive Array factor , Beamwidth for Rectangular array? 7 M

(b) Explain about elliptical arrays and derive the expression for directivity? 7 M

5. (a) Derive the aperture distribution for a continuous line source using Taylor's method? 7 M

(b) Design a linear array by using fourier transform method and write its advantages? 7 M

6. (a) What is a conformal array and explain different types? 7 M

(b) Explain the concept of multifaceted surfaces? 7 M

7.(a) What are the different types of feeds used for micro strip patch antenna and write the design equations for square patch antenna? 7 M

(b) Explain about electronic beam steering? 7 M

8. (a) What are the different antenna range measurements and explain? 7 M

(b) Explain the measurement of antenna impedance using microwave bench set up? 7 M