Roll No .....

EC-604

B.E. VI Semester

Examination, December 2016

Antenna And Wave Propagation

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each questions are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.
v) Assume suitable data if any missing. Answer must be to the point.

1. a) What is Radiation field?
   b) What do you mean by Hertzian dipole?
   c) Define radiation intensity and directivity.
   d) Derive an expression for the power radiated by a current element.

   OR

   Find the current required to radiate power of 50W at 60MHz from a 0.1λ.

2. a) What is Broad Side Array?
   b) What is End Fire Array?
   c) Give the statement of reciprocity theorem.
   d) Design a three element binomial array of isotropic elements positioned along the z-axis a distance 'd' apart, find the :
      i) Normalized excitation coefficient
      ii) Array factor

OR

Explain the principle of pattern multiplication. Give suitable diagram and examples.

3. a) What is Horn antenna?
   b) Write the applications of microstrip antenna.
   c) What is Turnstile Antenna?
   d) Explain the working of a Parabolic reflector antenna.

   OR

   Explain in detail log periodic antenna and what are their advantages.

4. a) What is continuous and discrete linear source?
   b) What is Element factor?
   c) What is Invisible region?
   d) A three element array is placed along the z-axis. Assuming the spacing between the elements is $d = \frac{\lambda}{4}$ and the relative amplitude excitation is equal to $a_1 = 1$, $a_2 = 2$ and $a_3 = 1$, find the angles where the array factor vanishes when $\beta = 0, \frac{\pi}{2}, \pi$ and $\frac{3\pi}{2}$. use Schelkunoff's method.

   OR

   Given a continuous line source, whose total length is 4λ, design a Taylor, one parameter, distribution array whose sidelobe is 30dB down from the maximum of the major lobe.

   a) What is Virtual Height?
   b) What is Skip Distance?
   c) Discuss "Maximum usable frequency".
   d) Explain duct propagation. Discuss its merits and demerits.

   OR

   Describe tropospheric propagation. List its applications.

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