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BIEL-013

B.Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

December, 2013

BIEL-013 : ANTENNAS AND PROPAGATION

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Each question has same weightage [**10** marks].*

*(ii) Attempt **any** 7 questions.*

1. (a) Describe the various mode of wave propagation. 5

   (b) A receiving antenna is located at 80kms from transmitting antenna. The height of the transmitting antenna is 100 m. What is the required height of receiving antenna ? 5

2. (a) Define Yagi Uda antenna with suitable diagrams. 5

   (b) Find the directivity and effective area of Half Wave dipole which operates at 500MHz. 5

3. (a) Define antenna and its functions. Also list down the parameters of antenna with required expressions. 5

   (b) Obtain the expression for normalised field strength of a uniform linear array. 5

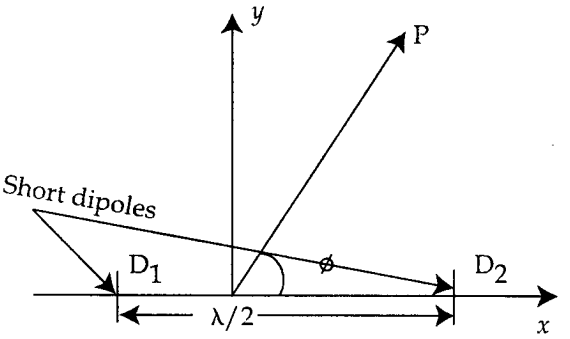
4. (a) Define the term radiation resistance. Also derive the expression for radiation resistance of Half Wave dipole. 5

(b) Define dipole arrays. Differentiate between broadside array and end fire array. 5

5. (a) Describe the term 'Reflectors'. Also describe the different types of reflectors in brief. 5

(b) How loop antenna is worked as a direction finder ? Derive the field expression of loop antenna. 5

6. (a) Obtain the resultant pattern of short verticle dipole as shown in fig : at point P. 5



(b) If an array of isotropic radiators is operated at 6 GHz and is required to produce a broadside beam, find NULL-to-NULL beam width if the array length is 10m. Also find its directivity. 5

7. (a) Plot the normalised field pattern if $n=2$, $d=\frac{\lambda}{2}$, $\alpha=0$. 5

(b) Explain Helical Antenna using neat diagrams. Also give its applications. 5

8. (a) Derive the expression of electric field for two isotropic point sources. 5

(b) Derive expressions for wave [wave equations] in free space and for conducting medium. 5

9. (a) State Principle of pattern multiplication with suitable example. 5

(b) Write down the various factors that affect space wave field strength. 5

10. Define **any two** of the following : 10

(a) Effects of earth's magnetic field

(b) Turnstile Antenna

(c) Log periodic Antenna