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BIEL-013

00581

B. Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

December, 2012

BIEL-013 : ANTENNAS AND PROPAGATION

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt **any seven** questions out of total **ten** questions.*

(ii) Use of scientific calculator is allowed.

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1. (a) Define the effective length and effective aperture of antenna. **4**

(b) Derive relationship between effective length and effective aperture. **6**

2. (a) Derive relationship between directivity and beam solid angle of antenna. **6**

(b) Calculate gain of antenna if f=50MHz, $Ae=10.00m^2$ **4**

3. (a) What is pattern multiplication theorem ? **5**

(b) Calculate directivity of end fire array if f = 100MHz, separation between elements = 50 cm, Numbers of elements is 5. **5**

4. (a) What are the advantages of folded dipole over linear dipole? 3

(b) Derive formulas of electric and magnetic field components of linear dipole. 7

5. (a) What do you mean by radiation resistance and directivity? 4

(b) Write the formula for field components of short dipole. 6

6. (a) Derive the formula for gain of the corner reflector antenna. 5

(b) Write the advantages, disadvantages and applications of lens antenna. 5

7. (a) Explain working principle of Helical antenna. 5

(b) Calculate the bandwidth of Log periodic Directional Antennas if 5

length of first element = 10 cm,

Number of elements = 5

Design ratio (τ) = 0.5,

and Apex angle (α) = 60°.

8. (a) What are the different wave propagation methods ? 4

(b) Derive the formula for electric field component of the ground wave. 6

9. (a) Derive formula for range of space wave. 6

(b) Calculate the range of space wave if Height of Transmitting Antenna is 25 m, Height of Receiving Antenna is 16 m and (Frequency) f is 50 MHz for standard form of refraction. 4

10. Attempt ***any two*** of followings : **2x5=10**

(a) Tropospheric scatter

(b) Refractive Index of troposphere.

(c) Horn antenna.