Code No: NR310402 **NR** **Set No. 2**

III B.Tech I Semester Examinations,November 2010
ANTENNASAND   WAVE PROPAGATION
Common to Electronics And Telematics, Electronics And Communication
Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Show that the radiated E-field electrical intensity of a quarter wave vertical monopole is,
$$E(\theta) = \frac{60\,I_m}{r}\left[\frac{Cos\left(\frac{\pi}{2}Cos\theta\right)}{Sin\theta}\right]V/m$$

   (b) For the above antenna if maximum current in the antenna is 20 Amps, find the electric field intensity at a distance of 2 Km along the axis perpendicular to the antenna and at an angle 30^0 from the antenna.   [10+6]

2. (a) What are the various differences between binomial and linear arrays.

   (b) Explain the effect of earth on antenna radiation pattern.   [8+8]

3. (a) Define "Zoning", and distinguish between curved surface zoning and plane surface zoning of a plano-convex lens antenna. Which one is advantageous and why? Discuss the merits and demerits of zoned antennas

   (b) With reference to aperture blocking, describe the performances of paraboloids and lenses.   [8+8]

4. Explain in detail about the methods for measuring half power beam width of horn antenna in both principal planes, with neat sketches.   [16]

5. Define maximum usable frequency and derive an expression for the same in the case of a thin ionospheric layer over a plane earth. Explain what is meant by the terms: skip distance, virtual height and optimum frequency.   [16]

6. (a) Sketch the typical geometry of a helical antenna radiating in axial mode, and list out all its parameters and basic characteristics. List out the expressions for HPBW, BWFN, directivity and axial ratio.

   (b) With a neat sketch, explain the image formation for the case of a 60^0 corner reflector.   [8+8]

7. (a) Explain the term Antenna terminal impedance and give the RLC equivalent circuit of it.

   (b) Derive an expression for the terminal impedance as a function of frequency and hence define its Bandwidth.   [8+8]

8. (a) Explain how the radiation pattern of folded dipole will be modified with the addition of a reflector and two directors parasitic elements.

1

NR   **Set No. 2**

(b) Explain the effect of ground on Rhombic antenna. [8+8]

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FIRSTRANKER

Code No: NR310402　　　　　**NR**　　　　　**Set No. 4**

III B.Tech I Semester Examinations,November 2010
ANTENNASAND　WAVE PROPAGATION
Common to Electronics And Telematics, Electronics And Communication
Engineering

Time: 3 hours　　　　　　　　　　　　　　　　　　　**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Define "Zoning", and distinguish between curved surface zoning and plane surface zoning of a plano-convex lens antenna. Which one is advantageous and why? Discuss the merits and demerits of zoned antennas

   (b) With reference to aperture blocking, describe the performances of paraboloids and lenses. [8+8]

2. Define maximum usable frequency and derive an expression for the same in the case of a thin ionospheric layer over a plane earth. Explain what is meant by the terms: skip distance, virtual height and optimum frequency. [16]

3. (a) What are the various differences between binomial and linear arrays.

   (b) Explain the effect of earth on antenna radiation pattern. [8+8]

4. (a) Explain how the radiation pattern of folded dipole will be modified with the addition of a reflector and two directors parasitic elements.

   (b) Explain the effect of ground on Rhombic antenna. [8+8]

5. (a) Show that the radiated E-field electrical intensity of a quarter wave vertical monopole is,
   $$E(\theta) = \frac{60\,I_m}{r}\left[\frac{Cos\left(\frac{\pi}{2}Cos\theta\right)}{Sin\theta}\right]\,V/m$$

   (b) For the above antenna if maximum current in the antenna is 20 Amps, find the electric field intensity at a distance of 2 Km along the axis perpendicular to the antenna and at an angle 30^0 from the antenna. [10+6]

6. Explain in detail about the methods for measuring half power beam width of horn antenna in both principal planes, with neat sketches. [16]

7. (a) Explain the term Antenna terminal impedance and give the RLC equivalent circuit of it.

   (b) Derive an expression for the terminal impedance as a function of frequency and hence define its Bandwidth. [8+8]

8. (a) Sketch the typical geometry of a helical antenna radiating in axial mode, and list out all its parameters and basic characteristics. List out the expressions for HPBW, BWFN, directivity and axial ratio.

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(b) With a neat sketch, explain the image formation for the case of a 60^0 corner reflector. [8+8]

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Code No: **NR310402**　　　　　**NR**　　　　　**Set No. 1**

III B.Tech I Semester Examinations,November 2010
ANTENNASAND   WAVE PROPAGATION
Common to Electronics And Telematics, Electronics And Communication
Engineering

Time: 3 hours　　　　　　　　　　　　　　　　　**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Explain how the radiation pattern of folded dipole will be modified with the addition of a reflector and two directors parasitic elements.

   (b) Explain the effect of ground on Rhombic antenna.　　　　　　　　　[8+8]

2. (a) Explain the term Antenna terminal impedance and give the RLC equivalent circuit of it.

   (b) Derive an expression for the terminal impedance as a function of frequency and hence define its Bandwidth.　　　　　　　　　　　　　[8+8]

3. (a) Define "Zoning", and distinguish between curved surface zoning and plane surface zoning of a plano-convex lens antenna. Which one is advantageous and why? Discuss the merits and demerits of zoned antennas

   (b) With reference to aperture blocking, describe the performances of paraboloids and lenses.　　　　　　　　　　　　　　　　　　　　[8+8]

4. (a) What are the various differences between binomial and linear arrays.

   (b) Explain the effect of earth on antenna radiation pattern.　　　　　[8+8]

5. (a) Show that the radiated E-field electrical intensity of a quarter wave vertical monopole is,
   $$E(\theta) = \frac{60\,I_m}{r}\left[\frac{Cos\left(\frac{\pi}{2}Cos\theta\right)}{Sin\theta}\right]V/m$$

   (b) For the above antenna if maximum current in the antenna is 20 Amps, find the electric field intensity at a distance of 2 Km along the axis perpendicular to the antenna and at an angle 30^0 from the antenna.　　　　　[10+6]

6. Explain in detail about the methods for measuring half power beam width of horn antenna in both principal planes, with neat sketches.　　　　　　　　[16]

7. Define maximum usable frequency and derive an expression for the same in the case of a thin ionospheric layer over a plane earth. Explain what is meant by the terms: skip distance, virtual height and optimum frequency.　　　　　[16]

8. (a) Sketch the typical geometry of a helical antenna radiating in axial mode, and list out all its parameters and basic characteristics. List out the expressions for HPBW, BWFN, directivity and axial ratio.

$\boxed{\textbf{NR}}$ $\boxed{\textbf{Set No. 1}}$

(b) With a neat sketch, explain the image formation for the case of a 60^0 corner
reflector.   [8+8]

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FIRSTRANKER

6

III B.Tech I Semester Examinations,November 2010
ANTENNASAND WAVE PROPAGATION
Common to Electronics And Telematics, Electronics And Communication
Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Define "Zoning", and distinguish between curved surface zoning and plane surface zoning of a plano-convex lens antenna. Which one is advantageous and why? Discuss the merits and demerits of zoned antennas

   (b) With reference to aperture blocking, describe the performances of paraboloids and lenses. [8+8]

2. (a) Explain how the radiation pattern of folded dipole will be modified with the addition of a reflector and two directors parasitic elements.

   (b) Explain the effect of ground on Rhombic antenna. [8+8]

3. (a) Explain the term Antenna terminal impedance and give the RLC equivalent circuit of it.

   (b) Derive an expression for the terminal impedance as a function of frequency and hence define its Bandwidth. [8+8]

4. Define maximum usable frequency and derive an expression for the same in the case of a thin ionospheric layer over a plane earth. Explain what is meant by the terms: skip distance, virtual height and optimum frequency. [16]

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7. (a) Sketch the typical geometry of a helical antenna radiating in axial mode, and list out all its parameters and basic characteristics. List out the expressions for HPBW, BWFN, directivity and axial ratio.

   (b) With a neat sketch, explain the image formation for the case of a 60^0 corner reflector. [8+8]

8. (a) Show that the radiated E-field electrical intensity of a quarter wave vertical monopole is,
   $$E(\theta) = \frac{60\,I_m}{r}\left[\frac{Cos\left(\frac{\pi}{2}Cos\theta\right)}{Sin\theta}\right] V/m$$

(b) For the above antenna if maximum current in the antenna is 20 Amps, find the electric field intensity at a distance of 2 Km along the axis perpendicular to the antenna and at an angle 30^0 from the antenna.   [10+6]

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