

AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
MODEL QUESTION PAPER (SET-1)

SUB/CODE:ANTENNAS &WAVE PROPOGATION/ EC2353

YEAR/SEC:III/A,B&C

PART-A

10*2=20

1. Define radiation intensity
2. Compare electric scalar potential and magnetic vector potential
3. State reciprocity theorem
4. What is Pattern Multiplication
5. Give an application of loop antenna
6. Give the value for radiation resistance of a centre-fed half wave dipole
7. Name and sketch an antenna which provides circularly polarized waves
8. What are the drawbacks of lens antenna
9. How spherical waves are generated.
10. What are the effects of earth curvature on tropospheric propagation.

PART-B

16*5=80

11. a.i) What is Retarded vector potential(4)
- ii) Derive the retarded vector potential for infinitesimal current element(12)

OR

- b.i) State and Prove reciprocity theorem(8)
- ii) Explain any two application of reciprocity theorem(8)
12. a.i) Derive the expression for power radiated by half wave dipole(8)
- ii) Derive the radiation resistance of loop antenna(8)

OR

- b. An array of N elements spaced $\lambda/2$ derive the field quantitative and draw its radiation pattern (16)
13. a. With neat diagram explain the principle of parabolic reflector antenna and various types of feed used.(16)

OR

b.Explain the principle of rectangular horn antenna with neat sketch.Draw the various types of Horn.(16)

14.a.With necessary illustrations explain the radiation characteristics of multi element log periodic antenna &its application(16)

OR

b.i)Explain the construction &Working principle of Yagi-uda antenna(8)

ii)Explain the design of rhombic antenna(8)

15.a.Explain the following terms:i)Optimum working frequency ii)Skip Distance iii)Virtual Height

iv)Maximum usable frequency v)Critical frequency

OR

b.Explain the structure of the ionosphere with neat diagram.Explain Troposcatter Propagation.

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MODEL QUESTION PAPER (SET-II)

SUB/CODE:ANTENNAS &WAVE PROPOGATION/ EC2353

YEAR/SEC:III/A,B&C

PART-A

10*2=20

- 1.Show the development of a dipole radiator from a transmission line.
- 2.Define Hertzian dipole.
- 3.Define:i)Collinear Arrays ii)Parasitic Arrays.
- 4.State the features of Binomial array.
- 5.What is travelling wave antenna
- 6.What are the types of loop antennas?List them
- 7.What is the need for transposing the lines in log periodic antenna.
- 8.What are secondary antennas?Give examples.
- 9.Define Gyro frequency.
- 10.What is multihop propogation.

PART-B

16*5=80

- 11.a.Derive the electric and magnetic field components of Hertzian Dipole(16)

OR

- b.Explain the terms:i)Radiation Resistance(2)ii)Directivity(2) iii)Effective Aperture(6) iv)Polarisation

- 12.a.i)Draw the radiation pattern of array of two point source with by calculating maxima,minima and HPPD.(16)

OR

- b. Show that the radiation resistance of halfwave dipole antenna is 73 ohms(16)

- 13.a.i)Explain the construction and working principle of slot antenna and derive the impedance (10)

- ii)Write short notes on corner reflector antenna(6)

OR

- b.i)Explain the construction of various types of lens antenna.(10)

ii) Explain about uniqueness theorem(6)

14.a. Explain the working of a biconical antenna and derive the expression for input impedance.

OR

b.i) Explain the working principle of microstrip antenna(8)

ii) Explain the working principle of Turnstile antenna(8)

15.a.i) Derive the refractive index of ionosphere where N is ionic density(12)

ii) Write short notes on various layers of ionosphere (4)

OR

b.i) Explain the effect of earth's magnetic field on ground wave propagation(10)

iii) What is the critical frequency for reflection at vertical incidence if the maximum value of electron density is $1.24 \times 10^6 \text{ cm}^{-3}$ (6)

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MODEL QUESTION PAPER (SET-III)

SUB/CODE:ANTENNAS &WAVE PROPOGATION/ EC2353

YEAR/SEC:III/A,B&C

PART-A

10*2=20

1. Define a) Field Pattern b) Power Pattern
2. Define Antenna Temperature.
3. State the features of Binomial array.
4. Calculate the physical height of a half wave dipole having antenna Q of 30 and bandwidth of 10MHz.
5. State Huygen's Principle.
6. What is the difference between slot antenna and its complementary dipole antenna
7. Draw the log periodic dipole antenna structures at UHF and VHF ranges
8. For a 20 turn helical antenna operating at 3GHz with circumference $C=10\text{cm}$ and the spacing between the turns 0.3λ , Calculate the directivity and half power beam width.
9. What are the factors that affect the propagation of radio waves.
10. A VHF communication link is to be established with 35W transmitter at 90 MHz. Find the distance upto which the line of sight communication may be Possible if the height of transmitting and receiving antennas are 40,25 metres respectively.

PART-B

16*5=80

11. a. Define i) Radiation Pattern ii) Effective Area iii) Half Power Beam Width iv) Anechoic Chamber (16)

OR

- b. Derive the far field pattern of oscillating electric dipole. (16)

12. a. Derive the far field pattern of half Wave dipole antenna and explain the principle of pattern multiplication (8+8)

OR

- b. i) Compare the Broadside Array and End Fire Array (8)

- ii) Explain the Binomial Arrays in detail (8)

13. a. Explain the principle of slot antenna and Lens Antenna with neat diagram (8+8)

OR

b.Explain the principle of parabolic reflector antenna and uniqueness Theorem(12+4)

14.a.i)Explain the procedure to measure radiation Pattern of an antenna (8)

ii)Explain the operation of three element Yagi-uda arrays(8)

OR

b.i)What are frequency independent antenna and explain log periodic dipole array(8)

ii)Explain the different modes of operation of helical antenna.(8)

15.a.i)Define Faraday rotation(6)ii)Effect of earth's magnetic field(10)

OR

b.Explain in detail:Duct Propagation,Troposcatter, Sky Wave Propagation