Reg. No.												

Question Paper Code	13464

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Seventh Semester

Electronics and Communication Engineering

EC8701 - ANTENNAS AND MICROWAVE ENGINEERING

Regulations - 2017

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Compare Radian and Steradian.	2	K2	CO1
2.	List the importance of Friis equation in communication.	2	K1	CO1
3.	State why loop antenna is named as magnetic dipole.	2	K1	CO2
4.	Compute the radiation resistance of current element whose overall length is λ/50.	2	K2	CO2
5.	Define Binomial array.	2	K1	CO3
6.	Define pattern multiplication.	2	K1	CO3
7.	Explain Faraday rotation.	2	K2	CO4
8.	Distinguish TWT and klystron amplifiers.	2	K2	CO5
9.	List the needs for impedance matching networks.	2	K1	CO6
10.	Draw the output stability circle and input stability circle with necessary equations.	2	K2	CO6

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Illustrate the concept of link budget and link margin with equation and suitable examples.	13	K2	CO1
		OR			
	b)	Summarize radiation pattern with a three dimensional model. Also explain HPBW, FNBW and the other lobes.	13	K2	CO1
12.	a)	Determine the power radiated by a halfwave dipole antenna and hence obtain its radiation resistance. Also find its directivity.	13	K3	CO2
		OR			
	b)	Construct a microwave pyramidal horn antenna and examine its radiation mechanism of with diagram.	13	K3	CO2

13.	a)	Express the direction of pattern maxima, direction of pattern minima, beamwidth, directivity of uniform broad side array of two point sources of equal amplitude and spacing.	*13*	*K2*	*CO3*
		OR			
	b)	Illustrate binomial array and derive the array factor of binomial array. Discuss with an example.	*13*	*K2*	*CO3*
14.	a)	Illustrate the working principle of Gunn diode as a transferred electron device with two valley models, Also draw the structure, equivalent circuit and V-I characteristics of Gunn diode.	*13*	*K2*	*CO5*
		OR			
	b)	Explain the operation of two cavity Klystron amplifiers with a neat diagram.	*13*	*K2*	*CO5*
15.	a)	An RF amplifier has the following S parameters: S11=0.3∟- 70°, S21=3.5∟85°, S12=0.2∟-10°, S22=0.4∟-45°. Further Vs=5V∟0°, Zs=40Ω and ZL=73Ω. Assuming Zo=50Ω. Find GT, GTU, GA and G.	*13*	*K2*	*CO6*
		OR			
	b)	Summarize in detail about the mixer characteristics with neat sketches.	*13*	*K2*	*CO6*

PART - C (1 × 15 = 15 Marks)

16.	a)	Explain the S-Matrix of E-Plane and H-Plane Tee with a neat diagram.	*15*	*K2*	*CO4*
		OR			
	b)	Summarize the principles and derive the scattering matrix of a directional coupler.	*15*	*K2*	*CO4*