Reg. No.												

Question Paper Code	13890

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 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.	List out the microwave frequency bands in Electromagnetic spectrum.	2	K1	CO1
2.	Relate the near field and far field concept of antennas.	2	K2	CO1
3.	Mention the disadvantages of loop antenna.	2	K1	CO2
4.	Illustrate the basic concept of reflector antenna.	2	K2	CO2
5.	Give the conditions to obtain end fire array antenna.	2	K1	CO3
6.	Draw the radiation pattern for broad side and end fire array.	2	K2	CO3
7.	State the directivity of directional couplers.	2	K1	CO4
8.	Recall the types of smart antennas.	2	K1	CO4
9.	Write the condition for oscillation in the reflex klystron.	2	K2	CO5
10.	List the needs for impedance matching networks.	2	K1	CO6

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a) (i)	Explain the antenna parameters. (a) Gain (b) Bandwidth (c) Input Impedance	6	K2	CO1
	(ii)	Deduce the maximum effective aperture of the antenna with directivity of 900 operating at a frequency of 10 GHz.	7	K2	CO1
		OR			
	b)	Illustrate a proper method to match the impedance of the antenna and explain in detail.	13	K2	CO1
12.	a)	Construct the concept of Link budget and Link Margin with equation and suitable examples.	13	K3	CO2
		OR			
	b)	Organize the Friis equation of an antenna with diagram. Also explain the individual parameters in the equation in detail.	13	K3	CO2

13. a) A pyramidal horn antenna having aperture dimensions of a = 5.2 cm and b = 3.8 cm is used at a frequency of 10GHz.Find its gain and HPBW. *13 K2 CO3*

OR

b) With necessary sketches, explain in detail about the radiation mechanism of a microstrip patch antenna. *13 K2 CO3*

14. a) Explain in detail about the resultant radiation pattern of two element array. *13 K2 CO4*

OR

b) Illustrate binomial array? Draw the pattern of 10 elements binomial array with spacing between the elements of 3λ/4 and λ/2 and Illustrate about the method of pattern multiplication. *13 K2 CO4*

15. a) Write down the working principle of Gunn diode as a transferred electron device with two valley model, Also draw the structure, equivalent circuit and V-I characteristics of Gunn diode. *13 K2 CO5*

OR

b) Interpret the power output mode curve/frequency characteristics of reflex klystron and draw the equivalent circuit also obtain the electronic spiral curve of reflex klystron. *13 K2 CO5*

PART – C (1 × 15 = 15 Marks)

16. a) (i) Distinguish power match and noise match in a Low Noise Amplifier. *8 K2 CO6*

(ii) Compare the different types of mixers with its principle of operation. *7 K2 CO6*

OR

b) Describe the characteristics of amplifier and Examine the transducer power gain, unilateral power gain, available power gain and operating power gain of a microwave amplifier using S parameters. *15 K2 CO6*