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Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations August-2022
ANTENNAS & WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Write short notes on Radiation Pattern and Beam Efficiency.	L3	6M
	b	Find the efficiency of antenna if radiation resistance is 72Ω and loss resistance is 8Ω.	L4	6M

OR

2	a	Explain Retardation Potential and Basic Maxwell Equation.	L3	6M
	b	Explain Effective Aperture & Types of Apertures.	L3	6M

UNIT-II

3	a	Derive the expression for radiation resistance of small loop antenna.	L1	6M
	b	Discuss the types of horn antennas.	L1	6M

OR

4	a	Explain about construction and operation of Yagi-Uda antenna	L1	6M
	b	Discuss the design considerations of pyramidal horn antenna.	L1	6M

UNIT-III

5	a	Explain about flat sheet, corner & paraboloidal reflectors.	L1	6M
	b	What are the different parameters effects the characteristics of micro strip antenna explain?	L1	6M

OR

6	a	A parabolic reflector antenna with diameter 20 m is designed to operate at frequency of 6 GHz and illumination efficiency of 0.54.Calculate antenna gain and decibels.	L1	6M
	b	What is reflector? What are the types of reflectors? Explain the features of parabolic reflectors.	L1	6M

UNIT-IV

7	a	What is principle of pattern multiplication? List the advantages and disadvantages.	L1	6M
	b	Define directivity. Give the procedure for the measurement of directivity.	L1	6M

OR

8	**a**	Write short notes on i) Linear array ii) binomial Array iii) EFA with increased directivity.	**L1**	**6M**
	b	Derive the expression for far field pattern of an array of two isotropic point sources at unequal amplitude & any phase.	**L1**	**6M**

UNIT-V

9	**a**	Explain about scattering phenomenon & Super refraction.	**L1**	**6M**
	b	Discuss the atmospheric effects in space wave propagation.	**L1**	**6M**

OR

10	**a**	Explain about plane earth reflections in ground wave propagation.	**L1**	**6M**
	b	A radio transmitted operating at a frequency 1.69 MHz is required to provide a ground wave having strength of 0.5 mV/m at a distance of 16 km. The transmitting antenna with an efficiency of 50% produces a radiating field proportional to $\cos\Theta$. The ground wave has $\sigma = 5\times10^{-5}$ υ/cm and $\varepsilon_r = 15$. Calculate the power transmitted.	**L1**	**6M**

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