Q.P. Code: 16EC418 **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations November-2020

ANTENNAS & WAVE PROPAGATION

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	**a**	Explain the following i) Effective Aperture ii) Types of Apertures.	**7M**
	b	Find the efficiency of antenna if radiation resistance is 72Ω and loss resistance is 8Ω.	**5M**

OR

2	**a**	An Antenna has a $E(\theta)=\cos\theta\cos2\theta$ for $0^O \leq \theta \leq 90^O$. Find HPBW and FNBW.	**6M**
	b	Write short notes on Radiation Pattern and Beam Efficiency.	**6M**

UNIT-II

3	**a**	Discuss directivity of small and large loop.	**6M**
	b	What are the practical design considerations for Monofilar helical antenna in normal mode?	**6M**

OR

4	**a**	Discuss the design considerations of pyramidal horn antenna.	**6M**
	b	What are parasitic elements &where they are used?	**6M**

UNIT-III

5	**a**	What is reflector? What are the types of reflectors? Explain the features of parabolic reflectors.	**6M**
	b	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.	**6M**

OR

6	**a**	Give the advantages and limitations of micro strip antennas.	**4M**
	b	Explain the basic principle of operation in lens antenna & distinguish between different types of lens antenna used in practice.	**8M**

UNIT-IV

7	**a**	Two identical point sources separated by a distance'd'. Each source having a field pattern given by $\boldsymbol{E_0}=\boldsymbol{E_1}\sin\Theta$. If $d=\frac{\lambda}{2}$ and the phase angle $\alpha=0$. Derive an expression for total field and also plot the pattern.	**8M**
	b	Explain near & far fields with respect to antenna measurements.	**4M**

OR

8	**a**	Explain any two techniques for antenna gain measurement.	**6M**
	b	Explain near & far fields with respect to antenna measurements.	**6M**

UNIT-V

9	**a**	Discuss the field strength variation with skip distance & virtual height.	**6M**
	b	It is required to establish a short wave communication between two points in earth's surface separated by 1200 km. Calculate the f_{MUF} and angle of take off the transmitted wave from the following data. Highest signal frequency return to earth after vertically upward propagation is 7.10MHz and virtual height of ionized layer is 200 km. Assume surface of earth to be flat.	**6M**

OR

10	**a**	Explain the refraction and reflection mechanisms in sky wave propagation.	**6M**
	b	What is fading & list different types of fading and explain.	**6M**

*** END ***