

CONTINUOUS INTERNAL EVALUATION- 3

Dept:EC	Sem / Div: VI	Sub: Microwaves and Antennas	S Code: 18EC63
Date: 05/08/2021	Time: 9:30-11:00 am	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

Q N	Questions	Marks	RBT	COs
PART A				
1 a	Obtain field expression of two isotropic point sources of same amplitude and opposite phase.	9	L3	CO3
b	Derive an expression for radiation resistance of short dipole antenna.	8	L3	CO3
c	A 16 turn helical beam antenna has a circumference of λ and a turn spacing of $\lambda/4$. Find: a. HPBW, b. Axial ratio and c. Directivity	8	L2	CO4
OR				
2 a	Determine the length L of H-plane aperture and flare angles θ_E and θ_H of a pyramidal horn for which the E-plane aperture a_E is 10λ . The horn is fed by a rectangular waveguide with TE_{10} mode. Let $\delta=0.2\lambda$ in the E plane and 0.375λ in the H plane. Also find beam widths and the directivity.	8	L3	CO2
b	Explain: i) Yagi-Uda antenna, ii) Parabolic reflectors	8	L2	CO2
c	State and prove the power theorem.	9	L2	CO3
PART B				
3 a	Prove that directivity for a source with Unidirectional pattern of $U_m \cos^n \theta$ is $D=2(n+1)$.	8	L3	CO3
b	Derive the expressions for field of dipole in general for the case of thin linear antenna.	8	L3	CO3
c	Discuss features of Helical antennas. Give construction details of Helical antenna.	9	L2	CO4
OR				
4 a	Draw the structure of a pyramidal horn antenna. Use the principle of equality of path length and bring out the optimum horn dimensions.	9	L2	CO4
b	Derive radiation resistance of a small single turn circular loop antenna with uniform phase current.	8	L3	CO4
c	Derive an expression for array factor & relative field of linear array of 'n' isotropic point sources of equal magnitude and spacing.	8	L3	CO3