

**Vivekananda College of Engineering & Technology, Puttur**  
 [A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®]  
 Affiliated to VTU, Belagavi & Approved by AICTE New Delhi

CRM08

Rev 1.10

<EC>

<18/07/2022>

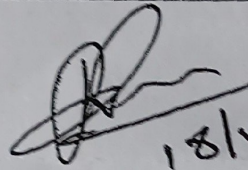
**CONTINUOUS INTERNAL EVALUATION - 3**

Dept:EC	Sem / Div:6 A&B	Sub: Microwave and Antennas	S Code:18EC63
Date:22/07/2022	Time: 9:30- 11:00 am	Max Marks: 50	Elective:N


Note: Answer any 2 full questions, choosing one full question from each part.

QN	Questions	Marks	RBT	CO's
<b>PART A</b>				
1 a	Derive the expressions for the far field component of short dipole.	10	L3	CO3
b	State and prove power theorem.	7	L3	CO3
c	A 16 turn helical beam antenna has a circumference of $\lambda$ and a turn spacing of $\lambda/4$ . Find a. HPBW, b. Axial ratio and c. directivity	8	L3	CO4
<b>OR</b>				
2 a	Explain the following terms with respect to antennas. i) Beam area ii) Radiation intensity iii) Beam efficiency iv) Directivity, v) Radiation resistance.	10	L2	CO3
b	Calculate the exact directivity for a 3 dimensional source having the pattern $U = U_m \sin^2\theta \sin^3\Phi$ $0 < \theta < \pi; 0 < \Phi < \pi$ .	7	L3	CO3
c	Derive radiation resistance of a small single turn circular loop antenna with uniform phase current	8	L3	CO4
<b>PART B</b>				
3 a	Prove that directivity for a source with Unidirectional pattern of $U_m \cos^n\theta$ , where n can be any number	9	L3	CO3

	expressed as $D=2(n+1)$ .			
b	Derive an expression for array factor & relative field of linear array of 'n' isotropic point sources of equal magnitude and spacing.	9	L3	CO3
c	Draw the structure of a pyramidal horn antenna. Use the principle of equality of path length and bring out the optimum horn dimensions.(CO4)	7	L3	CO4
<b>OR</b>				
4 a	Obtain field expression of two isotropic point sources of same amplitude and phase.	9	L3	CO3
b	Derive an expression for radiation resistance of short electric dipole.	8	L3	CO3
c	Discuss the following antenna types (i) Helical Antenna ii) Yagi Uda Array	8	L2	CO4

  
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Prepared by: Mahabaleshwara Bhat P

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HOD