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Internal Assessment Test 3 – May. 2018

			Intern	ıal Assessmei	nt Tes	t 3 – May. 2	2018					
Sub:	M	Microwave Theory and Antenna  Sub Code:  15TE63 Branc h:							TCE			
Date:	23/05/2018	Duration:	90 mins	Max Marks:	50	Sem / Sec:	6			OBE		
	Answer any five questions.								MA RKS	СО	RBT	
	Define power theorem. The radiation intensity of an antenna is given by $U(\theta, \varphi) = \cos^4 \theta \sin^2 \varphi$ , for $0 \le \theta \le \frac{\pi}{2}$ and $0 \le \varphi \le 2\pi$ . Find  i. Exact Directivity ii. Half-power beam width							[10]	CO4	L2, L3		
2	Derive an expression and draw the filed pattern of an array of two isotropic point sources of same amplitude and no phase difference. Also determine its maxima, minima and HPBW.								[10]	CO4	L2	
3	Eight-point sources are placed $^{\lambda}/_{6}$ apart. They have a phase difference of $^{\pi}/_{3}$ between adjacent elements. Obtain the filed pattern. Also find FNBW and HPBW.								[10]	CO4	L3	
4	Derive the expressions for electric field and magnetic field components in far-field from a short dipole.								[10]	CO4	L3	
5	Derive the expressions for radiation resistance of the following antennas:  i. Short dipole ii. Small loop								[10]	CO4, CO5	L3	
6	Derive the expression for field components from the following antennas:  i. Small loop antenna  ii. Loop antenna general case								[10]	CO5	L3	
7	Determine the length L, H-plane aperture and flare angles $\Theta_E$ and $\Theta_H$ (in the E and H planes) of a pyramidal horn for which the E-plane aperture $a_E = 10\lambda$ . The horn is fed by a rectangular waveguide with $TE_{10}$ mode. Let $\delta = 0.2 \lambda$ in the E-plane and $0.375 \lambda$ in the H-plane. What are the beam widths? What is the directivity?								[10]	CO5	L4	
8.	Discuss the practical design considerations of helical antenna.								[10]	CO5	L3	
9	Write short no		i. Yagi-U	Jda array eriodic anteni	na				[10]	CO5	L2	