## **GUJARAT TECHNOLOGICAL UNIVERSITY** M. E. - SEMESTER – III • EXAMINATION – SUMMER • 2013

Su Su Tii Ins	bject bject me: 1 struc 1. 2. 3.	code: 732701Date: 15-05-2013Name: Smart Antennas for Wireless Communication0.30 am - 01.00 pmTotal Marks: 70ctions:Attempt all questions.Make suitable assumptions wherever necessary.Figures to the right indicate full marks.	
Q.1	(a)	<ul> <li>Explain the following terms:</li> <li>(i) Freshnel and fraunhofer region.</li> <li>(ii) Effective length of antenna.</li> <li>(iii) Directivity.</li> </ul>	06
	(b)	Derive the relationship between maximum directivity and maximum effective area.	08
Q.2	<b>(a)</b>	What is smart antenna? How it is different from conventional antenna? Write down key benefits of the smart antenna.	07
	(b)	Find the HPBW and draw radiation pattern for (i) $E(\theta)=\sin \theta$ and (ii) $E(\theta)=\cos \theta$ for $0^{\circ} \ddot{O} \theta \ddot{O} 90^{\circ}$	07
	(b)	<b>OR</b> The radiation intensity of antenna is $U = U_m \cos^n \theta$ , Prove that the directivity for a source with a unidirectional pattern can be express as D ( $\theta$ )=2(n+1). [Note: assume suitable data].	07
Q.3	(a) (b)	Explain Dynamic Re-sectoring Using Smart Antennas. Write short note on Switched beam forming networks	07 07
Q.3	(a) (b)	Write short note on Fixed Beam forming networks. What is meant of spatial signature? What are the advantage of spatial signature.	07 07
Q.4	(a) (b)	Write short note on Rake receiver. Compare coherent and non-coherent spatial processors. OR	07 07
Q.4	(a) (b)	Downlink Beam-forming for CDMA. Explain Range and Capacity Analysis Using Smart Antennas	07 07
Q.5	(a) (b)	Explain TDOA. List out the different PL system and explain any two in detail.	07 07
Q.5	(a) (b)	Write short note on Wideband Smart antenna System. Explain Reverse Channel Performance of Multi-cell Systems with Spatial Filtering at the Base Station	07 07

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