Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. SEMESTER III–EXAMINATION – WINTER 2015

Subject code: 2732701 **Date: 04/12/2015**

Subject Name: Smart Antennas for Wireless Communication

Time: 2:30 PM to 5:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	How rake receiver with spatial filtering can perform better compared to conventional rake receiver? Explain with suitable example.	**07**
	(b)	Explain and differentiate narrow-band and wide-band smart antenna systems.	**07**
Q.2	**(a)**	Explain and compare Fixed Beam forming networks and Switched Beam Systems.	**07**
	(b)	Describe the smart antenna techniques in downlink beam forming for CDMA system. Also describe the problems arise during implementation of downlink beam forming and possible solutions.	**07**
		OR	
	(b)	Explain various Large Scale Path Loss models.	**07**
Q.3	**(a)**	Define and describe coherent and non-coherent CDMA spatial processors.	**07**
	(b)	List and explain benefits of smart antenna technology.	**07**
		OR	
Q.3	**(a)**	Explain free-space propagation model and link budget design for it.	**07**
	(b)	Describe operation of cellular mobile system. List and describe various mobile systems.	**07**
Q.4	**(a)**	Derive the equation of array factor and steering vector for smart antenna system. Describe physical importance of array factor and steering vector.	**07**
	(b)	Explain Spatial Diversity, Diversity Combining, and Sectoring.	**07**
		OR	
Q.4	**(a)**	Describe the cell design concept in cellular communication. Also differentiate Macrocell, microcell, picocell and femtocell.	**07**
	(b)	List and define fundamental parameters of antenna (minimum 7 parameters).	**07**
Q.5	**(a)**	Explain various TDOA estimation techniques.	**07**
	(b)	Describe various Position Location systems in detail.	**07**
		OR	
Q.5	**(a)**	How system range can be improved in CDMA system using spatial filtering?	**07**
	(b)	How system capacity can be improved in CDMA system using spatial filtering?	**07**

****