Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– I (New course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 2714401 **Date:13/05/2015**

Subject Name: Wireless Communication Theory

Time: 10:30 am to 1:00 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)**	A cellular service provider provides a scheme which can tolerate SIR of 15 dB in the worst case. Find the optimal value of N for (a) omnidirectional antennas (b) 120º sectoring and (c) 60º sectoring. Should sectoring be used? If so, which case should be used? (Assume n=4).	**07**
	(b)	Explain OFDM with transmitter-receiver and applications.	**07**
Q.2	**(a)**	Explain briefly: (1) TMSI (2) IMEI (3) CDPD (4) EDGE (5) Dwell time (6) WLL (7) Cell dragging	**07**
	(b)	Describe the concept of cell splitting. What will happen if we reduce the size of new cell as half of the old cell? Also mention its limitations.	**07**
		OR	
	(b)	List the strategies to improve the system capacity and explain any one.	**07**
Q.3	**(a)**	Suppose that a mobile station is moving along a straight smooth surface between base stations BS1 and BS2. The distance between BS1 and BS2 is 2000 m. Assume that the received power in dBm at Base station is given by $P_r=P_0- 10*n*\log (d/d_0)$, where d is the distance between mobile station and base station in meters. P_0 is the power at distance d_0 from the mobile. Assume that P_0=0dBm and d_0=1m. Let n denote path loss exponent which is 2.9. Given that the minimum usable level of signal is -88dBm and the mobile is currently connected to BS1, determine the hand-off margin if hand-off time is 4.5 seconds and the mobile speed is 100 km/hr.	**07**
	(b)	Define multiple access technique. Compare TDMA, FDMA and CDMA.	**07**
		OR	
Q.3	**(a)**	Explain co-channel interference and derive the equation of Signal to Interference Ratio (SIR) for hexagonal geometry with N=7.	**07**
	(b)	Compare GSM technique with CDMA technique for mobile communication.	**07**
Q.4	**(a)**	Give the classification of data channel and control channel and explain all the control channels in GSM.	**07**
	(b)	What is meant by LMDS and MMDS? Explain any one with block diagram.	**07**
		OR	
Q.4	**(a)**	Explain CDMA 2000 Cellular Technology	**07**
	(b)	Draw frame format for a normal burst in GSM. Explain burst, frame, multiframe, hyperframe, superframe.	**07**
Q.5	**(a)**	Explain issues related with mobile adhoc network.	**07**
	(b)	Explain IEEE 802.11 WLAN.	**07**
		OR	
Q.5	**(a)**	Explain security aspects in Wireless Networks.	**07**
	(b)	Explain UMTS in detail.	**07**