Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(New course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 2720502 **Date: 09/12/2015**

Subject Name: Wireless and Mobile 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)**	Compare Cell Splitting, Sectoring and Micro cell zone concepts.	**07**
	(b)	Explain Mean excess delay, RMS delay spread, Coherence bandwidth and Doppler Spread for multipath channels.	**07**
Q.2	**(a)**	Consider two different cellular systems that share the following characteristics. The frequency bands are 825-845 MHz for uplink and 870-890 MHz for the downlink. A duplex circuit consists of one 30 kHz channel in each direction. The systems are distinguished by the reuse factor, which are 4 and 19 respectively. For these systems, (i) Find the number of simultaneous communications that can be supported by a single cell in each system. (ii) Suppose that in each systems the cluster of cells (4,19) is duplicated 16 times, find the number of simultaneous communications that can be supported by each system. (iii)Suppose the average user makes 6 calls per 24 hours and mean call duration is 6 minutes, estimate the total number of users that can be supported by each system.	**07**
	(b)	Explain Clarke's model for flat fading.	**07**
		OR	
	(b)	Explain how hand-off takes place in GSM. Also explain MAHO, Intersystem hand-off and prioritizing handoffs.	**07**
Q.3	**(a)**	A cellular system has a total RF bandwidth of 12.5 MHz and simplex channel spacing of 30 KHz. The system contains 20 control channels. The system is required to cover a total area of 3600 Km^2. (a) Calculate the number of traffic channels/cell, if the cluster size is 9. (b) Determine the total number of cells needed to cover the entire area. (c) How many calls can be simultaneously processed by each cell if 8 users can share each channel?	**07**
	(b)	Enlist all indoor and outdoor propagation models. Discuss the Okumura's and Hata's prediction method with necessary equations.	**07**
		OR	
Q.3	**(a)**	Determine the propagation path loss for a radio signal at 900 MHz cellular system operating in a large urban city with a base station Tx, antenna height of 100 meter and mobile Rx antenna height of 2 m. the mobile unit is located at a distance of 4km. Use the HATA propagation path loss model.	**07**
	(b)	Enlist types of small scale fading.	**07**
Q.4	**(a)**	What are the types of routing in Mobile Ad-hoc Network? Describe all REACTIVE type of routing protocols in detail.	**07**
	(b)	Explain Security issues and QoS in wireless networks.	**07**
		OR	

Q.4	**(a)**	Explain types of space diversity reception methods.	**07**
	(b)	Write a short note on Cognitive Radio.	**07**
Q.5	**(a)**	Explain OFDM signal processing in detail.	**07**
	(b)	Distinguish between AWGN channel, Rayleigh fading channel and Rician fading channel in a wireless environment. What are the distinct applications of Rayleigh and Rician channel modeling in wireless communications?.	**07**

OR

Q.5	**(a)**	Explain MIMO diversity technique and its application in modern wireless communication system.	**07**
	(b)	Write a short note on RAKE Receiver.	**07**

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