Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER • 2015

Subject Code: 183204 **Date:05/05/2015**

Subject Name: Wireless and Mobile Communication

Time:10.30AM-01.00PM **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)**	Explain the concept of frequency reuse for cellular communication systems and also explain channel assignment strategies for GSM Systems.	**07**
	(b)	Explain in details the third generation(3G) wireless networks standards:- 1) 3G W-CDMA (UMTS) 2) 3G cdma2000 3) 3G TD – SCDMA	**07**
Q.2	**(a)**	What is large scale propagation? Explain in detail the free space propagation model.	**07**
	(b)	Prove that for a hexagonal symmetry ,the co-channel reuse ratio is given by $Q=\sqrt{(3N)}$.	**07**
		OR	
	(b)	For given path loss exponent (a) n=4 and (b) n=3, find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal to interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are six co-channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations.	**07**
Q.3	**(a)**	Briefly Describe Hand-off strategies in cellular system. Compare soft and hard Hand-off.	**07**
	(b)	Explain the three basic propagation mechanisms which impact the propagation of signal in a mobile environment.	**07**
		OR	
Q.3	**(a)**	For 7 cell reuse regular cellular structure with equal size hexagonal cells, Determine the Signal-to-Interference (Co-channel) ratio in dB, assuming path loss exponent n=4. For the same system, if, each cell is sectored in 120° sectors, what will be the improvement in Signal-to-interference ratio compared to non-sectored system, in dB?	**07**
	(b)	Give complete classification of types of small-scale fading.	**07**
Q.4	**(a)**	Draw the block diagram of the reference architecture of GSM and explain the function of each subsystem.	**07**
	(b)	Explain the difference between co-channel interference and adjacent channel interference. Derive the equation for the signal to interference ratio for co-channel interference.	**07**
		OR	
Q.4	**(a)**	Explain in detail the IS-95 CDMA forward and reverse channels with block diagram.	**07**
	(b)	Compare cell splitting and cell sectoring technique and also explain umbrella cell approach.	**07**
Q.5	**(a)**	Explain in detail the wireless Ad-Hoc network with neat diagram.	**07**

	(b)	Write a brief note on OFDM.	**07**

OR

Q.5	**(a)**	Describe GPRS system architecture.	**07**
	(b)	Explain in detail the time division multiple access with its key features and comments on the efficiency of TDMA.	**07**

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