Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER VIII • EXAMINATION – WINTER - 2013

Subject code: 183204 **Date: 09-05-2013**

Subject Name: Wireless Communication

Time: 10:30 am to 01:00 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)**	Differentiate Cell Splitting and Cell Sectoring techniques.	**04**
	(b)	Explain in detail the third generation (3G) wireless networks standards. (a) 3G W-CDMA (UMTS)(b)3G CDMA2000 (c) 3G TD-SCDMA	**07**
	(c)	Explain the concept of frequencyreuse for cellular communication systems.	**03**
Q.2	**(a)**	What is large scale propagation? Explain in detail the free space propagation model.	**07**
	(b)	Cellular system has 32 cells; each cell has 1.6 km radius and the system reuse factor of 7. The system is to support 336 traffic channels in total. Determine the total geographical area covered, the number of traffic channels per cell and total number of simultaneous cells supported by this system.	**07**
		OR	
	(b)	If a total of 33 MHZ of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 KHZ simplex channels to provide full duplex voice and control channels , compute the number of channel available percell if a system uses (a) four-cell reuse ,(b) seven-cell reuse, and (c) 12 - cell reuse. If 1MHZ of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each for each of the three systems.	**07**
Q.3	**(a)**	Find the median path loss using Okumura's model for d-50Km, h_{te}=100m, h_{re} = 10m. If EIRP from base station is 1KW at 900 MHz, Find received power. Take A_{mu}(900 Mhz(50Km)) = 43 dB and G_{AREA} = 9 dB.	**05**
	(b)	Define the following terms: (a)Coherence Bandwidth (b) Coherence Time	**05**
	(c)	DerivetheexpressionforS/Iratioforco-channelinterferenceforcellular systems.	**04**
		OR	
Q.3	**(a)**	Assumingsixco-channelinterferingcells,findtheS/Iratioforpathlossco-efficientofn=3andn=4.ConsiderclustersizeN=7.Inwhichcase15dBrequirementis met?What needs to be changed to meet the same condition in second case?	**05**
	(b)	BrieflyDescribeHand-offstrategiesincellularsystem.ComparesoftandhardHand-off.	**05**
	(c)	Define the following terms: (a) Fraunhofer Region (b) Fresnel Zones (c) EIRP (d) Doppler Spread	**04**
Q.4	**(a)**	Brieflyexplain the GSM Architecture.	**05**
	(b)	Explain the concept of Umbrella cell.	**05**
	(c)	Explain the frame structure for GSM.	**04**
		OR	

Q.4	**(a)**	Explain the services provided by GSM.	**05**
	(b)	Explain the concept of spread spectrum and also explain DSSS technique to generate the spread spectrum.	**05**
	(c)	Explain GSM Speech Processing in Brief.	**04**
Q.5	**(a)**	Explain IS-95 CDMA System.	**07**
	(b)	Explain Tine Division Multiple Accessin detail with its key features and comment on the efficiency of TDMA.	**07**
		OR	
Q.5	**(a)**	Explain in detail about the various types of channels used in GSM.	**07**
	(b)	Write short note on CDPD. (Cellular Digital Packet Data).	**07**