Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. VIIth Semester–Examination – Nov- 2011

Subject code: 171004

Subject Name: Wireless Communication

Date:26/11/2011 **Time: 10:30 am – 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)** Define following terms: **07**

(A.) - Control Channel (B.)- Forward Channel (C.)- Handoff
(D.)- Reverse Channel (E.)- Half Duplex System (F.)- Paging System
(G.)- Mobile switching center

(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)** Explain in detail the types of small scale fading (including time delay and Doppler spread). **07**

(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 per cell 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**

OR

(b) Explain the difference between cell splitting and sectoring. Prove that the co-channel reuse ratio is given by **07**

$$Q = \sqrt{3N},$$

where $\mathbf{N = i^2 + ij + j^2}$ (Use cosine law & hexagonal geometry)

Q.3 **(a)** Explain the difference between co-channel interference and adjacent channel interference. Derive the equation for the signal to interference ratio. **07**

(b) Explain in detail the impulse response model of a multipath channel. **07**

OR

Q.3 **(a)** Explain in detail the spread spectrum slinding correlator channel sounding and frequency domain channel sounding **07**

(b) What is large scale propagation? Explain in detail the free space propagation model. **07**

Q.4 **(a)** Explain in detail the time division multiple access with its key features and comments on the efficiency of TDMA. **07**

(b) Explain in detail the operation of CDMA2000 cellular technology with it key features. **07**

OR

Q.4 **(a)** What is a non linear effect in FDMA? Explain in detail the operation of OFDM with neat diagram. **07**

(b) Explain in detail about the various types of channel used in GSM. **07**

Q.5	**(a)**	Explain in detail the signal processing in GSM including speech coding ,channel coding(data & control channels).	**07**
	(b)	What is soft handoff? Explain in detail RAKE receiver with neat diagram.	**07**
		OR	
Q.5	**(a)**	Explain in detail the CDMA forward channel operation.	**07**
	(b)	Explain in detail the wireless Ad-Hoc network with neat diagram.	**07**

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