Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –I Examination Feb. - 2012

Subject code: 710206N **Date: 21/02/2012**
Subject Name: Wireless Computer Networks
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)**	Explain the Two-Ray model for propagation of radio waves under mobile radio environments. State the relationship between Pt and Pr. Show these relations in decibels, showing also the fade margin.	**07**
	(b)	Explain the following, with diagrams: (1) Multipath (2) Small Scale Fading (3) QPSK Modulation (4) FHSS (5) DSSS	**07**
Q.2	**(a)**	Given: W: Transmission Bandwidth R : Information Bandwidth, N : Spread Spectrum Spread Factor, P : Received Power of signal at the base station, from each mobile terminal, under enforced ideal power control, Sr: Minimum Signal to Noise ratio required, M: Simultaneous mobile users on the reverse channel. Derive an expression for maximum value of M, for the CDMA systems. Also suggest changes that will be applicable to this value of M, due to the effects of the sectorization gain GA, voice activity interference reduction factor Gv, and the interference increase factor Ho. Explain what is Cell Breathing incase of CDMA systems.	**07**
	(b)	For a particular CDMA system, 4 < Sr < 5, Bandwidth of the Channel is 1.25 MHz and the transmission rate R is 19200 bps. Find the range of the capacity M for this CDMA cell, without and with considering the effect of GA, GV and Ho, taking their appropriate values.	**07**
		OR	
	(b)	Explain in brief, with good diagrams, Multi-Carrier, Multi Symbol and Multi Rate OFDM Modulation. Discuss relative advantages of each scheme.	**07**
Q.3	**(a)**	Explain with diagrams Pure ALOHA, Slotted ALOHA, CSMA / CA and RTS/CTS protocols.	**07**

	(b)	For an FDMA system, state relationship between RL: Radius of a cell DL: Distance between co-channel cell N : Frequency reuse ratio. Also, state and derive the relationship, between Sr: Signal to noise ratio and frequency reuse ratio. Show this relation also in decibels. How is this relationship helpful in capacity calculations?	**07**
		OR	
Q.3	**(a)**	For FDMA systems, discuss following architectural methods for capacity expansion: (1) Cell Splitting (2) Directional Antennas with Cell Sectoring Support your answer with proper derivations.	**07**
	(b)	What you understand by Fixed, Dynamic and Hybrid Channel allocation schemes? Explain each case in detail.	**07**
Q.4	**(a)**	Draw the Reference Architecture of GSM. Explain in brief the function of every block. With diagrams, show the type of "Bursts" used to implement GSM.	**07**
	(b)	Describe the logical channels in GSM. State in brief the function of each.	**07**
		OR	
Q.4	**(a)**	Draw the GPRS system architecture, and explain function of each block. Explain in brief the mobility management in GPRS.	**07**
	(b)	Explain different types of Handoffs possible in CDMA systems. Why is Power Control important in CDMA? Explain Close Loop Reverse Link Power Control in IS-95.	**07**
Q.5	**(a)**	Explain Registration and Handoff in case of 802.11. What do you understand by "solicited beacon" in the context of Handoff under 802.11?	**07**
	(b)	Explain in detail: Bluetooth, Wireless Geo-location Systems	**07**
		OR	
Q.5	**(a)**	Explain in detail: Mobile IP, Wi-MAX	**07**
	(b)	In case of 802.11, explain 1, The primary operation of CSMA-CA in brief and 2, Power management	**07**

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