Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code:X81102 **Date:11/12/2015**

Subject Name: Wireless Communication

Time: 02:30pm to 05:00pm **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)**	What is the core concept of cellular communications? What are the important parameters of the wireless communication network designed on cellular approach?	**07**
	(b)	Calculate the number of channels per cell for a cluster size of 7 in a cellular system which has 1001 radio channels available for handling traffic. The serving area of the complete system is 2100 km^2 and the area of the cell is 6 km^2.	**07**
Q.2	**(a)**	What is scattering? How does it differ from reflection and diffraction?	**07**
	(b)	Consider a base station transmitter operating at 900 MHz carrier frequency . For a mobile moving at a speed of 72 kmph, calculate the received carrier frequency if the mobile is moving directly away from the base station transmitter. Repeat the problem if the mobile is moving in a direction which is 60˚ to the direction of arrival of the transmitted signal..	**07**
		OR	
	(b)	A wireless communication transmitter having RF power of 113 W is used with an antenna of 5 dBi gain. Calculate the EIRP and the power density at a distance of 11 km.	**07**
Q.3	**(a)**	Describe the architecture of GSM system.	**07**
	(b)	What is the difference between a logical channel and a physical channel ? Describe the functions of various types of GSM logical channels.	**07**
		OR	
Q.3	**(a)**	List the advantages of CDMA over FDMA and TDMA.	**07**
	(b)	Discuss various diversity techniques.	**07**
Q.4	**(a)**	Compare CDMA and GSM technologies.	**07**
	(b)	Why does power control become one of the main issues for the efficient operation of CDMA ?	**07**
		OR	
Q.4	**(a)**	Derive an expression for mobile point-to-point propagation model to determine the received signal power. Explain the use of two-ray model to justify mobile radio path loss and antenna height effects.	**07**

Q.4	**(b)**	Describe the parameters responsible for signal loss due to foliage.	**07**
Q.5	**(a)**	If SIR of 20 dB is required, what should be the cluster size that should be used for maximum capacity ? Use n= 4	**07**
	(b)	A TDMA digital cellular system is designed to accept S/I ratio of 15 dB. Find the optimum value of cluster size for 6 sector 60˚ directional antenna design.	**07**

OR

Q.5	**(a)**	Give differences between Wi-Fi and Bluetooth technologies.	**07**
	(b)	Explain in detail the wireless Ad-Hoc network with neat diagram.	**07**

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