Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE –SEMESTER 7 (NEW) EXAMINATION- SUMMER 2018

Subject Code: 2171004 Date: 03-05-2018

Subject Name: Wireless Communication

Time: 02:30 pm to 05:00 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: Cluster, Hand off, Co-channel cells	**03**
	(b)	Explain the concept of frequency reuse in cellular system.	**04**
	(c)	Draw and explain the GSM system architecture.	**07**
Q.2	**(a)**	Compare Wi-Fi and Wi-max technology.	**03**
	(b)	Illustrating the upgrade paths briefly describe 2G and 3G cellular network.	**04**
	(c)	Explain Co-channel interference in cellular system. A cellular system has a cluster size 7 and path loss exponent n = 4. Determine the S/I for the system. Now, if each cell is sectored in 120^0 sectors, what will be the improvement in S/I compared to non-sectored system in dB?	**07**
		OR	
	(c)	Explain two types of trunked system. A total of 24 MHz of bandwidth is allocated to a particular FDD cellular system that uses two 30 KHz simplex channels to provide full duplex voice and control channels. Assume each cell phone user generates 0.1 Erlangs of traffic. (i) Find the number of channels in each cell for a four-cell reuse system. (ii) If each cell is to offer capacity that is 90% of perfect scheduling, find the maximum number of users that can be supported per cell.	**07**
Q.3	**(a)**	Briefly explain different channel assignment strategies.	**03**
	(b)	Assume a receiver is located 10 km from a 50 W transmitter. The carrier frequency is 6 GHz and free space propagation is assumed, Gt = 1 and Gr = 1. Find the power at the receiver in dbm.	**04**
	(c)	Describe the various outdoor propagation models.	**07**
		OR	
Q.3	**(a)**	Mention the techniques to improve the capacity in cellular system and explain any one.	**03**
	(b)	What is the delay spread bound τ_{max} of a 220 MHz public land-mobile radio (PLMR) system if P_T = 1 watt (+30 dBm) and P_{Rmin} = -90 dBm?	**04**
	(c)	Explain different types of small-scale fading.	**07**
Q.4	**(a)**	Give the classification of GSM channels.	**03**
	(b)	Define: Control Channel, Forward Channel, Reverse Channel, Roamer.	**04**
	(c)	Explain the process of call origination and call termination in GSM.	**07**
		OR	
Q.4	**(a)**	Explain three types of soft handoffs in IS-95 standard.	**03**
	(b)	Write short note on: Bluetooth.	**04**
	(c)	Explain the concept of RAKE receiver in CDMA.	**07**
Q.5	**(a)**	Write the equation for efficiency of TDMA and Number of channels in TDMA.	**03**
	(b)	Compare TDMA, FDMA and CDMA techniques.	**04**

	(c)	What is Zigbee? Describe the different topologies used in zigbee network.	**07**

OR

Q.5	**(a)**	Explain: *I-persistent* CSMA, *non-persistent* CSMA, *p-persistent* CSMA.	**03**
	(b)	Describe the features of FDMA technique.	**04**
	(c)	Explain the working of UWB radio. Discuss the features, advantages and disadvantages of UWB technology.	**07**

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