Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2171004 **Date: 26/11/2018**

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.**

			MARKS
Q.1	**(a)**	Why hexagonal cell shape is preferred in cellular architecture?	**03**
	(b)	Illustrating the upgrade paths 2G and 3G cellular network and describe in brief.	**04**
	(c)	Draw and Explain GSM system architecture.	**07**
Q.2	**(a)**	Explain the following terms : (i) Cell dragging (ii) RSSI (iii) Dwell time	**03**
	(b)	Explain the concept of frequency reuse in cellular system.	**04**
	(c)	For a regular hexagonal geometry show that co-channel reuse ratio is $Q = \sqrt{3N}$, where $N= i^2+ij+j^2$.	**07**
		OR	
	(c)	If a signal to interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (1) n=4 (2) n=3 ? Assume that there are six co channel cells in the first tier and all of them are at the same distance from the mobile. Use suitable approximations.	**07**
Q.3	**(a)**	Briefly describe Hand-off strategies in cellular system.	**03**
	(b)	Briefly explain different channel assignment strategies.	**04**
	(c)	Consider a transmitter which radiates a sinusoidal carrier frequency of 1850 Mhz. For a vehicle moving 60 mph, compute the received carrier frequency if the mobile is moving: i. Directly toward the transmitter. ii. Directly away from the transmitter. iii. In a direction which is perpendicular to the direction of arrival of transmitted signal.	**07**
		OR	
Q.3	**(a)**	Explain the concept of umbrella cell.	**03**
	(b)	Mention the techniques to improve the capacity in cellular system and explain any one.	**04**
	(c)	A unit gain antenna with a maximum dimension of 1 m produces 50 W power at 900 MHz. Find (i) the transmit power in dBm and dB, (ii) the received power at a free space distance of 5 m and 100 m.	**07**
Q.4	**(a)**	What is Brewster angle?	**03**
	(b)	Explain: I-persistent CSMA, non-persistent CSMA, p-persistent CSMA.	**04**
	(c)	Explain free space propagation model with necessary equations.	**07**
		OR	

Q.4	**(a)**	What is Huygen's principle?	**03**
	(b)	Compare TDMA, FDMA and CDMA techniques.	**04**
	(c)	Describe the various outdoor propagation models.	**07**
Q.5	**(a)**	Explain three types of soft handoffs in IS-95 standard.	**03**
	(b)	Compare Wi-Fi and WiMAX.	**04**
	(c)	Explain the working of UWB radio. Discuss the features, advantages and disadvantages of UWB technology.	**07**

OR

Q.5	**(a)**	Give the classification of GSM channels.	**03**
	(b)	Determine frame efficiency of a TDMA frame structure used in GSM system.	**04**
	(c)	Write a short note on OFDM.	**07**

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