Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2171004 Date:16/05/2019

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.**

			MARKS
Q.1	**(a)**	Define: (1) Control Channel (2) Mobile Switching Center (3) Full Duplex Systems	**03**
	(b)	With figure explain Frequency Reuse concept in detail. Define cluster size and write the equation for system capacity.	**04**
	(c)	Explain handoff scenario at cell boundary with figure.	**07**
Q.2	**(a)**	Describe co channel interference and adjacent channel interference.	**03**
	(b)	Explain the concept of trunking and grade of service .	**04**
	(c)	Explain sectoring to improve coverage and capacity of a system.	**07**
		OR	
	(c)	Explain :(1) Cell splitting (2) Microcell Zone concept To improve coverage and capacity of a system.	**07**
Q.3	**(a)**	Explain three basic propagation mechanisms.	**03**
	(b)	Explain the factors influencing small scale fading.	**04**
	(c)	Explain ground reflection (Two-ray) Model with figure and derive the equation for Electric Field E_{TOTAL}.	**07**
		OR	
Q.3	**(a)**	Explain Doppler Shift with equation.	**03**
	(b)	Explain small scale fading(based on time delay spread)	**04**
	(c)	Explain Spread spectrum channel impulse response measurement system with diagram.	**07**
Q.4	**(a)**	Explain Frequency Division Multiple Access(FDMA) in wireless communication with figure.	**03**
	(b)	Explain small scale fading(based on Doppler spread)	**04**
	(c)	Explain direct RF channel impulse response measurement system with diagram.	**07**
		OR	
Q.4	**(a)**	If a total of 33 MHz of band width 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: (1) four cell reuse (2) seven cell reuse and (3) 12 cell reuse	**03**
	(b)	Explain Time Division Multiple Access (TDMA) in wireless communication with figure.	**04**
	(c)	Draw GSM system architecture and explain its working principle in detail.	**07**
Q.5	**(a)**	Calculate the Brewster angle for a wave impinging on a ground having a permittivity of $\varepsilon_r = 4$	**03**

	(b)	Explain Code Division Multiple Access (CDMA) in wireless communication with figure.	**04**
	(c)	Consider a transmitter which radiates a sinusoidal carrier frequency of 1850 MHZ. For a vehicle moving 60 mile per hour, compute the received carrier frequency if the mobile is moving (1) Directly toward the transmitter (2) directly away from the transmitter and (3) in a direction which is perpendicular to the direction of arrival of the transmitted signal.	**07**

OR

Q.5	**(a)**	Explain: (1) static channel assignment strategy (2) dynamic channel assignment strategy	**03**
	(b)	Write a short note on 3G W-CDMA(UMTS)	**04**
	(c)	With diagram explain various 2.5 G and 3G upgrade paths for the major 2G technologies.	**07**

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