Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER- VII EXAMINATION-SUMMER 2023
Subject Code: 2171004   **Date: 30/06/2023**
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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	(a)	What is micro cell zone concept in cellular communication? State the merits of it?	03
	(b)	Elaborate the cell splitting concept with it's merits for wireless communication.	04
	(c)	Describe the cell sectoring concept with examples and it's importance in communication.	07
Q.2	(a)	A cellular service provider decides to use digital TDMA system which can tolerate a signal to interference ratio is 15 dB in worst case. Find the optimal value of N for (a) omni directional antenna (b) 120 degree sectoring (c) 60 degree sectoring. Should sectoring be used ? if so, which case (60 degree,120 degree) should be used ? Assume path loss component (n=4).	03
	(b)	What is near far problem in communication? how it can be reduced?	04
	(c)	Discuss briefly the frequency reuse concept and give detail insight about the trade-off between channel capacity and co- channel cell interference in cellular environment.	07

OR

			MARKS
	(c)	Explain Handoff mechanism briefly and mention the steps to execute it. State the difference between hard and soft- handover.	07
Q.3	(a)	State the difference between large scale fading and small scale fading with examples.	03
	(b)	Explain following terms with respect to the fading mechanism. 1. Fast fading and Slow Fading 2. Flat fading and Frequency selective fading	04
	(c)	Derive frill's formula for free space path loss calculation and find the received power at the distance of 5 K.M. if reference power P_0= 1mW at reference distance d_0= 1 K.M. Assume path loss component n=2.	07

OR

Q.3	(a)	State the difference between Rayleigh fading and Rician fading propagation model.	03
	(b)	What is power delay profile for multipath propagation? . Explain it briefly.	04
	(c)	Explain Fresnel zone concept and knife edge diffraction loss briefly.	07
Q.4	(a)	State the merits of TDMA over FDMA scheme?. Explain Time and frequency duplexing concept in a detail.	03
	(b)	Enlist the available control and traffic channels in GSM.	04
	(c)	Draw and explain GSM Architecture and explain the function of each blocks.	07

Q.4 **(a)** Explain the steps involved in call origination in GSM ? **03**
(b) Explain Authentication and Encryption process in GSM ? **04**
(c) Explain GPRS architecture with detail insight of components? **07**

Q.5 **(a)** State the merits of CDMA in communication. **03**
(b) Explain Bluetooth technology with technical specification. **04**
(c) What are the major standards of WiFi technology? Compare them with respect to the frequency band and range of communication. **07**

OR

Q.5 **(a)** State the role of rake receiver in wireless communication. Explain it briefly. **03**
(b) State the Frequency hopping concepts of CDMA ? **04**
(c) Draw and explain OFDM transmitter and receiver with it's importance in communication. **07**