GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code:2171004   **Date:28-11-2025**

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.**

Q.1	**(a)**	Draw and explain hexagonal cellular concept.	**03**
	(b)	Explain cell splitting concepts with neat and clean figure.	**04**
	(c)	Describe evolution of 1G, 2G and 3G mobile phone systems.	**07**
Q.2	**(a)**	Define the following terms regarding wireless communication: (1) Co-channel cell (2) Cell dragging (3) Dwell time	**03**
	(b)	Give comparison of hard and soft hand off.	**04**
	(c)	Enlist and explain the different channel assignment strategy in cellular communication system.	**07**

OR

	(c)	Prove that for a regular hexagonal geometry, the frequency reuse ratio and cluster size are related by the relationship $Q = (3N)^{1/2}$, where $N= i^2 +j^2 +ij$	**07**
Q.3	**(a)**	State the difference between large and small-scale propagation loss.	**03**
	(b)	Explain frequency reuse concept.	**04**
	(c)	Derive the expression for Feher's upper bound.	**07**

OR

Q.3	**(a)**	Explain Bluetooth technology with the important parameters.	**03**
	(b)	Explain the concept of cell sectoring in detail with neat and clean figure.	**04**
	(c)	Explain CDMA Technology for cellular systems in detail.	**07**
Q.4	**(a)**	Enlist various multiple access schemes used in wireless communications explain in brief.	**03**
	(b)	Define the following terms. (1) Reverse channel (2) Simplex system (3) Control channel (4) Half-duplexing	**04**
	(c)	Discuss the Okumura's prediction method with necessary equations.	**07**

OR

Q.4	**(a)**	Draw and explain Umbrella cell approach.	**03**
	(b)	Explain wireless Ad-Hoc network.	**04**
	(c)	Explain the need for RAKE receivers for a CDMA based wireless communication system.	**07**

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Q.5 **(a)** Explain co-channel interference. **03**

(b) State the important steps to establish the call in GSM. **04**

(c) Discuss Frequency Division Multiple Access (TDMA) in detail. write equation for number of channels that can be simultaneously supported in a FDMA system **07**

OR

Q.5 **(a)** What do you mean by multipath fading? **03**

(b) Compare Wi-Fi and Wi-MAX system parameters. **04**

(c) Draw a neat sketch of GSM architecture and state the functions of the following: BSC, MSC, VLR, HLR, AUC. **07**

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