

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII EXAMINATION – SUMMER 2025****Subject Code:2170710****Date:23-05-2025****Subject Name:Mobile Computing and 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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Explain data rate and bandwidth?	03
	(b) Enlist and Explain the different modulation techniques in the signal theory.	04
	(c) Explain the Nyquist Theorem. Find the relationship among the following terms: Channel Capacity (C), Bandwidth (B) and Signal-to-Noise Ratio (SNR).	07
Q.2	(a) What is noise? Discuss briefly types of noise and its effect on transmission signal.	03
	(b) Consider parabolic reflective antenna with a diameter of 4 m, operating at 16 GHz, what is the effective area and antenna gain? (Hint: $c = 3 \times 10^8$)	04
	(c) A TDMA/FDD based GSM system uses 25 MHz for the forward link, which is broken in to radio channels of 200 KHz. If 8 speech channels are supported on a single radio channel and if no guard band is assumed, find the no of simultaneous users that can be accommodated in GSM.	07
	OR	
	(c) What are HLR and VLR? Describe its functions in call routing and roaming.	07
Q.3	(a) Define IMSI, IMEI and MS-ISDN and write their use.	03
	(b) Explain OSI model with function of each layer.	04
	(c) What is the bandwidth efficiency for FSK, ASK, PSK and QPSK for a bit error rate of 10^{-7} on a channel with an SNR of 12 dB?	07
	OR	
Q.3	(a) Explain frequency reuse in cellular systems with a proper diagram.	03
	(b) Demonstrate the functioning of a convolutional encoder for (2,1,3) and also implement its state diagram.	04
	(c) What is the circuit switching? Explain the communication phases of circuit switching. Differentiate between Datagram and Virtual circuit operation?	07
Q.4	(a) Explain ATM Service categories.	03
	(b) What is the need for ARQ? Explain Sliding Window Protocol with example.	04
	(c) What is Mobile IP? Explain discovery, registration and tunneling in Mobile IP.	07
	OR	
Q.4	(a) Write a note on piconet and scatternet.	03
	(b) For Message M = 1010001101 and Pattern P = 110101, find CRC.	04
	(c) Write a short note on selective repeat ARQ.	07
Q.5	(a) What is fading? Differentiate between: a) fast and slow fading b) flat and selective fading	03
	(b) Name different states of android activity life cycle.	04

- (c) Define the Frequency Hopping in Spread Spectrum? Write a note on TDMA, FDMA and CDMA. **07**
- OR**
- Q.5** (a) What is Handover? Explain types of it in brief. **03**
- (b) Explain Android EditText and TextView control with an example. **04**
- (c) Draw and explain the Bluetooth Protocol Architecture. **07**
