Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (OLD) EXAMINATION – WINTER 2023

Subject Code:161001   **Date:11-12-2023**
Subject Name:Digital 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.**

Q.1	**(a)**	Draw block diagram of Pulse Code Modulation. Explain each block in detail.	**07**
	(b)	Classify and explain various detection scheme of FSK.	**07**
Q.2	**(a)**	Define CDF. State and explain its properties.	**07**
	(b)	Discuss Central limit theorem.	**07**
		OR	
	(b)	Define random variable. Find mean, mean square and variance of Gaussian random variable.	**07**
Q.3	**(a)**	Derive the equation for channel capacity in binary symmetric channel.	**07**
	(b)	Compare Coded and Un coded digital system.	**07**
		OR	
Q.3	**(a)**	Explain Huffman coding with example.	**07**
	(b)	Explain the process of Convolution coding using code tree.	**07**
Q.4	**(a)**	Explain Scrambling with neat diagram.	**07**
	(b)	Discuss optimum binary receiver.	**07**
		OR	
Q.4	**(a)**	Draw and explain the block diagram of Regenerative repeater.	**07**
	(b)	Explain Delta Modulation and Delta Demodulation with help of block diagram.	**07**
Q.5	**(a)**	Draw and Explain the block diagram frequency hopping.	**07**
	(b)	Explain modulation and demodulation process of QPSK.	**07**
		OR	
Q.5	**(a)**	Define ISI. Discuss Nyquist's first criteria for zero ISI.	**07**
	(b)	Explain modulation and demodulation process of QAM.	**07**

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