Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (OLD) EXAMINATION – SUMMER 2017

Subject Code: 1722202 **Date:10/05/2017**

Subject Name: Advanced Digital Communication

Time:10:30 A.M. to 01:00 P.M. **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain orthogonal and orthonormal signals. How does Gram-Schmidt procedure help to construct orthogonal set?	**07**
	(b)	Write short notes on " Data detection for controlled ISI"	**07**
Q.2	**(a)**	Draw the block diagram and explain in detail of the following 1. QAM receiver 2. M-ary PSK receiver.	**07**
	(b)	Explain in detail correlation demodulator	**07**
		OR	
	(b)	Compare several Digital Modulation methods at 10^{-5} symbol error probability.	**07**
Q.3	**(a)**	Evaluate the probability of error for M-ary PSK.	**07**
	(b)	Explain the effect of intersymbol interference on eye opening and prove Nyquist condition for zero ISI.	**07**
		OR	
Q.3	**(a)**	Evaluate the probability of error for M-ary PAM.	**07**
	(b)	Define equalizer and list various types of equalization methods. Discuss the error rate performance of linear MSE equalizer.	**07**
Q.4	**(a)**	State the different non-linear modulation methods with memory and explain any one of them in detail.	**07**
	(b)	State different non-decision directed loop methods for carrier phase estimation and explain any one in detail.	**07**
		OR	
Q.4	**(a)**	What is simplex signal and bi-orthogonal signal? List out all properties of simplex and bi-orthogonal signals.	**07**
	(b)	Explain in detail with block diagram of non-decision directed estimation of timing for baseband PAM.	**07**
Q.5	**(a)**	Explain in detail Code Division Multiple Access.	**07**
	(b)	Discuss in brief: Characterization of Fading Multipath Channels.	**07**
		OR	
Q.5	**(a)**	Explain in detail Orthogonal Frequency Division Multiplexing.	**07**
	(b)	Draw and Explain Signal Space Diagram for following, considering M=2, M=4, M=8: (a) PAM (b) PSK (c) Combined PAM-PSK (d) Rectangular QAM.	**07**

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