Reg. No.												

Question Paper Code	12407

M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

First Semester

M.E. - Communication Systems

20PCOEL102 - DIGITAL COMMUNICATION RECEIVERS

(Regulations 2020)

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Define Source encoding.	*2,K1,CO1*
2.	What are the characteristics of linear time variant channel?	*2,K1,CO1*
3.	Identify decision rule for maximum likelihood detection.	*2,K1,CO2*
4.	Distinguish between linear and non – linear modulation techniques.	*2,K2,CO2*
5.	List the properties of orthonormal signals.	*2,K1,CO3*
6.	Indicate the advantage of diversity technique.	*2,K1,CO3*
7.	Tell the relation between the multipath delay spread and coherence bandwidth.	*2,K1,CO4*
8.	List the characteristics of nakagami Channel distribution.	*2,K1,CO4*
9.	What are the advantages of blind equalizers?	*2,K1,CO5*
10.	Indicate the matrix form of LMS algorithm.	*2,K1,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Discuss multi amplitude continuous phase FSK signal with mathematical expression.	*13,K2,CO1*
		OR	
	b)	Explain in detail about the memory-less modulation methods.	*13,K2,CO1*
12.	a)	Consider the set of signals s1(t). s2(t), s3(t) which are given below. Using GSOP find the set of ortho-normal basis function represents their signals. Also express each of their signals in terms of set of basis function. 1. S1(t) = 2 $0 \leq t \leq 1$ 2. S2(t) = -4 $0 \leq t \leq -2$ 3. S3(t) = 3 $0 \leq t \leq 3$	*13,K2,CO2*
		OR	

b) Describe about the matched filter and discuss how the SNR is maximized. *13,K2,CO2*

13. a) Illustrate the performance of square-law detected M=4 orthogonal signals as a function of diversity. *13,K2,CO3*

OR

b) (i) Discuss RAKE matched filter for processing wideband signals. *7,K2,CO3*

(ii) Summarize the performance of square –law detected FSK. *6,K2,CO3*

14. a) Explain probability of a bit error for DPSK with diversity for Rayleigh fading. *13,K2,CO4*

OR

b) Describe the probability of error for soft-decision decoding Linear block codes. *13,K2,CO4*

15. a) Illustrate the block schematic of a carrier recovery for M-PSK system and timing recovery for an unmodulated carrier. *13,K2,CO5*

OR

b) Explain the usage of non-decision directed loop to obtain phase estimate. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Explain in detail the Adaptive Decision feedback Equalizer. *15,K2,CO6*

OR

b) (i) Illustrate Kalman algorithm. *8,K2,CO6*

(ii) Explain linear prediction using lattice filter. *7,K2,CO6*