F **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 51S03

M.E. DEGREE EXAMINATION, MAY 2018

First Semester

Communication Systems

15PCM103-MODULATION AND CODING TECHNIQUES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 3= 15 Marks)

1.	Draw the state and trellis diagram for miller code.	CO1-U
2.	Compare linear equalization and decision feedback equalization.	CO2- Ana
3.	State Information capacity theorem.	CO3-U
4.	How to achieve the coding gain by TCM?	CO4-Ana
5.	State the principle of turbo coding.	CO5-U

PART –B (5 x 14= 70Marks)

6.	(a)	Derive the power spectral density of Linearly modulated signals.	CO1- App	(14)
		Or		
	(b)	Determine the power spectral density of CPFSK modulated signal.	CO1- U	(14)
7.	(a)	Derive the minimum mean squared error for zero forcing decision feedback equalizer (DFE-ZF)	CO2- App	(14)
		Or		
	(b)	Discuss the convergence properties of LMS algorithm and excess MSE due to noisy gradient estimates in LMS algorithm.	CO2- App	(14)

8.	(a)	Write short notes on Sphere packing and random coding bound.	CO3- U	(14)
		Or		
	(b)	Discuss in detail about constellation-constrained AWGN channel.	CO3- U	(14)
9.	(a)	Derive the eight state Trellis code for 8-PSK modulation.	CO4 -App	(14)
		Or		
	(b)	Discuss in detail about trellis coded modulation with suitable example.	CO4- App	(14)
10.	(a)	Derive mathematical description of the Max-Log-MAP algorithm.	CO5- Ana	(14)
		Or		
	(b)	Discuss Low density parity check (LDPC) code with suitable example.	CO5- Ana	(14)

PART - C (1 x 15 = 15 Marks)

11.	(a)	Explain the RLS algorithm with the exponentially weighted factor.	CO2- U	(15)
		Or		
	(b)	Explain with derivation the modifications of MAP algorithm.	CO5- E	(15)